For future updates, please refer to the MDT website at http://www.mdt.state.mt.us/. Once at the site, click on Contractor's System tab OR click on http://www.mdt.state.mt.us/contract/ to take you directly to the Contractor's System website. Click on the Plans, Specs & Drawings dropdown and select Standard Specifications Supplemental.

The following Sections have been revised since September 1, 1995. Current revisions are noted by an * before the date on this index.

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MONTANA SUPPLEMENTAL SPECIFICATIONS

The following are supplementary or amendatory to the 1995 Edition of the Standard Specifications for Road and Bridge Construction insofar as they apply to this contract.

101.04 ADDENDUM Page 2 7-1-96

Rescind the heading and replace with the following:

101.04 ADDENDUM OR AMENDMENT.

101.11 BOARD OF CONTRACT APPEALS Page 3 8-1-04

Rescind subsection 101.11 and replace with the following:

101.11 BOARD OF CONTRACT APPEALS. The Board consists of the Chief Engineer, the Preconstruction Engineer and the Chief Counsel, with the Construction Engineering Services Engineer as Secretary to the Board. The FHWA Field Operations Engineer and Construction Engineer are non-voting members.

101.19 CONTRACT Page 3 11-1-97

Rescind the second paragraph of Subsection 101.19 and replace with the following:

The Contract includes the proposal; contract form; contract bond; specifications; general and detail plans; Detailed Drawings; Notice to Proceed; Materials Manual; and all change orders, extra work orders, including authorized contract time extensions, that are required to complete the project.

101.41 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) Page 6 10-1-04

Rescind the last sentence of Subsection 101.41 and replace with the following:

The manual may be supplemented by Standard or Supplemental Specifications, Special Provisions, and by project circumstances when approved by the Engineer (See MUTCD, Section 2A.03 Standardization of Application).

101.40 MAJOR ITEM Page 5 3-1-05

Rescind Subsection 101.40 and replace with the following:

101.40 MAJOR ITEM. Individual bid items having an original contract value equal to or exceeding 5 percent of the total original contract amount.

101.42 MATERIALS Page 6 4-1-99

Rescind Subsection 101.42 and replace with the following:

101.42 MATERIALS. Substances specified for use in the construction of the project. Furnish new materials unless otherwise specified or approved.

101.48.1 PROJECT RECORDS Page 6 11-1-97

Add the following new Subsection:

101.48.1 Project Records. All correspondence, reports, proposals, minutes, articles, logs, calendars, diaries, computations, tabulations, computer printouts, bills, statements, invoices, vouchers, bills of lading, schedules, purchase orders, contracts, agreements, accounts, checks, tape recordings, photostats, video recordings, photographs, sketches, drawings, charts, graphs, transcripts, and other similar objects, any of which pertains to a project or project costs, of a contractor and its subcontractors.

101.49 PROPOSAL Page 6 11-1-97

Rescind Subsection 101.49 and replace with the following:

101.49 Proposal. A written offer by a bidder, on Department furnished forms, to complete the project at the quoted prices within the specified contract time. Also called “Bid Proposal.”

101.52 QUALITY CONTROL DEFINITIONS Page 6 11-1-97

Rescind Subsection 101.52 and replace with the following:

101.52 Quality Control and Quality Assurance Definitions

1) Quality Control.
   A. Quality Control Plan - A Contractor prepared plan describing the type and frequency of Contractor inspection, sampling, and testing necessary to measure and control the various properties governed by the Contract specifications.
2) Quality Assurance.
   A. Acceptance Plan - A statistically based procedure for evaluating acceptance test results.
   B. Lot – A discrete quantity of material evaluated for acceptance.
   C. Price Reduction - A pre-established decrease in payment to the Contractor for a contract bid item in which the quality and workmanship, determined by statistical means is at the lower limit of the acceptance range.
   D. Quality Assurance - A statistical based process to determine the acceptability of a given product. Also known as " lot by lot" or "lot" basis or system.
   E. Quality Incentive Allowance - A pre-established increase in payment to the Contractor for a contract bid item in which a superior level of quality and workmanship, determined statistically, was performed.
   F. Random Sampling – A selection procedure in which all potential samples have an equal chance of being selected for testing.

101.54 RESOURCES Page 7 11-1-97

Rescind Subsection 101.54 and replace with the following:

101.54 RESOURCES. The labor, equipment, and material necessary to perform work on a contract bid item or other contract work element.

101.56 RESPONSIBLE BIDDER Page 7 11-1-97

Rescind Subsection 101.56 and replace with the following:

101.56 RESPONSIBLE BIDDER. A bidder that the Department determines has the skill, ability, and integrity to perform the project. The Department's standards of responsibility are in Section 18.3.201, Administrative Rules of Montana.

101.69 SUBCONTRACTOR Page 8 4-1-96

Rescind Subsection 101.69 and replace with the following:

101.69 SUBCONTRACTOR. An individual or legal entity to which a Contractor subcontracts, assigns or otherwise disposes of any part of the work.

101.82.1 BUSINESS DAY Page 9 8-1-04

Add the following new Subsection:

101.82.1 Business Day. All days are considered business days except Saturdays, Sundays and holidays.

Rescind Section 102 and replace with the following:

SECTION 102
BIDDING REQUIREMENTS
AND CONDITIONS

102.01 JOINT-VENTURE BIDS. Execute a "Declaration of Joint Venture and Power of Attorney" form, available from the Department's Contract Plans Bureau, to submit bid packages for highway construction as a joint venture. Designate the joint venture business name and specifically authorize a person to execute all bid packages and contracts with the Transportation Commission on behalf of all individuals and legal entities of the joint venture. Authorize this person to receive all monies due under the Contract and issue binding receipts and releases with the Department. Include joint-venture affidavits in the proposal.
Joint venture firms do not need to separately incorporate.

102.02 CONTENTS OF BID PACKAGE. The bid package ordinarily includes the following:

A. Proposal.
B. Disadvantaged Business Enterprise (DBE) Requirements.
C. Schedule of Items.
D. Special Provisions
E. Current Supplemental Provisions.
F. Wage Rate Schedules.
G. Other documents included by reference but not attached.
H. FHWA Form 1273- (Required Contract Provisions for Federal-Aid Construction Contracts) when applicable.
I. EEO Affirmative Action Requirements on Federal and Federal-Aid Construction Contracts.
J. Contract Plans.

102.03 CONTRACTOR REGISTRATION. Montana law requires all contractors to register with the Montana Department of Labor & Industry.
Register before executing a contract on Federal-aid projects.
Register before submitting a bid on State-funded projects.
Contact the Department of Labor & Industry at 1-406-444-7734 for more information.

102.04 ISSUANCE OF PROPOSALS. The Department reserves the right to refuse to issue a bid package to a bidder for any of the following reasons:

A. Uncompleted work that the Department determines might hinder or prevent the prompt completion of additional work.
B. Default under previous contracts.
C. Failure to reimburse the Department for an overpayment made on any contract or contracts after written notification of the overpayment that is due.
D. Failure to pay, or satisfactorily settle, all bills due for labor and material on any contract in force at the time of issuance of proposals.
E. Unsatisfactory performance on a previous or current contract.
F. Misconduct that is of such a serious nature as to adversely affect the contractor's ability to perform future work.

Request bid packages from the Department.

Pay the Department the sum stated in the Invitation for Bids for each copy of the bid package.

102.05 QUANTITIES OF WORK IN THE PROPOSAL. Submit unit bid prices for the estimated quantities.
Estimated quantities may be increased or decreased under the contract.
Payment is made for the actual quantities of work performed and accepted or materials furnished and accepted under the Contract.

102.06 EXAMINATION OF DOCUMENTS AND SITE OF WORK. Examine the proposed work site including the existing field staking and documents before submitting a proposal. Submitting a proposal is an affirmative statement by the bidder that the bidder has examined the site and is satisfied with the conditions to be encountered in performing the work and the bid package requirements.
The Department is not bound by any statement or representation concerning conditions or description of the work unless included in the bid package. Do not rely on oral explanations or instructions given by Department employees or agents before award of the contract. Accept these as non-binding oral explanations or instructions and relying on them is solely at the Bidder's risk.
Immediately submit any request for an explanation of the meaning or interpretation of the bid package, in writing, to the Engineer or to the Department's Q & A Forum found at *http://www.mdt.state.mt.us/contract/*.
The records of any subsurface investigation conducted by the Department are available for inspection as a public document. When not included in the bid package, inspect available records at the Materials Bureau, Bridge Bureau in Helena, or the District where the project is located.
The records of subsurface investigations are not a part of the bid package or contract, but are available to all bidders for informational purposes only. There is no warranty or guaranty, either expressed or implied, that the subsurface investigation records will disclose the actual conditions that will be encountered during the performance of the work. Department subsurface investigation results may differ from a bidder's independent subsurface evaluation due to different sampling techniques, the date of the investigation, etc. Using or relying on Department subsurface

investigations is at the bidder's risk. The Bidder must perform and rely on its independent subsurface evaluation made before submitting a bid proposal. Submittal of a bid is an affirmative statement that an independent subsurface evaluation was made and Department subsurface investigations were not relied on.

Individual test boring log data included in the Department's subsurface investigation records apply only to that particular boring taken on the date indicated. The character of any material or conditions between or around test borings on the date of the site examination are not conclusive.

Submission of a bid waives any potential claim of the above, including a claim of justifiable reliance on such information or materials.

Do not take advantage of an apparent error, omission or ambiguity in the bid package. Upon discovery, immediately notify the Engineer in writing if an error, omission, or ambiguity exists and why it appears erroneous, omitted, or ambiguous. Advise bidders submitting a subcontract quotation of this obligation and clarify their responsibility to include this information with their subcontract quotation. The Department will clarify the error, omission, or ambiguity and, if necessary and possible, issue an addendum to all prospective bidders before opening bid packages.

Do not submit a bid proposal or a subcontract quote without receiving clarification. Failure to provide written notification is a waiver of the error, omission or ambiguity, and additional compensation or contract time will not be allowed.

The Department, for most projects, prepares preliminary bid packages (plans and special provisions) to provide advance notice to prospective bidders of the general requirements for those projects. Preliminary packages are not in final form, and there may be substantial changes between the preliminary and final bid package released for bid letting. Use the preliminary packages only for general familiarization with the project. Request final bid packages for use in bidding. Do not base any bid on a preliminary package.

102.07 BIDDING REQUIREMENTS. Submit bids only using the Electronic Bid System (EBS) that generates the required Proposal, Schedule of Items and Disadvantaged Business Enterprise (DBE) requirements.

A. Distribution Procedures. Indicate prime bidder status when ordering a bid package. The Department will provide electronic files to prospective prime bidders containing EBS project files for all projects in the letting.
Prime bidders possessing EBS packages are issued electronic files containing addenda when required.

B. Bidding Requirements. Ensure bids submitted using the EBS format contain a proposal guarantee, a EBS generated proposal, Schedule of Items, and DBE requirements when applicable.
Ensure the EBS schedule of items is a single continuous printout for each individual project bid, evidenced by all Schedule of Items sheets having the same check number. Written changes to the Schedule of Items, or a bidder’s non-submission of every page from the Expedite Bid EBS file, (including all Schedule of Items pages and all DBE pages), renders the bid non-responsive, and the bid will not be read.
Acknowledge addenda using the amended EBS project file to generate the proposal, Schedule of Items and DBE requirements. The printout indicates acknowledgment of receipt of addenda when the correct project file is used. Return a computer disk containing the complete project files for all projects bid with the bid package.

C. Determination of Bid Responsiveness. Bids are opened at the designated time and inspected to determine if the following requirements are met:
1) Schedule of Items: Unit Prices: Are provided for all required bid items. A complete and verifiable schedule of items is provided. Each sheet of the schedule of items must contain the same check number, to ensure that the unit bid prices correspond with the total. There are no written changes to the schedule of items.
2) Proposal Guarantee: If a bid bond; it is on the most current version of the Department-furnished form; is signed and sealed in the proper places; a copy of the agent's Power of Attorney for the insurance company is attached; and contains the correct and complete project number; all signatures are original (stamped signatures are unacceptable).
3) Addenda: All addenda are acknowledged by using the correct electronic file.
4) Proposal: Is signed and notarized in the designated places; all signatures are original (stamped signatures are unacceptable).

A bid is non-responsive if the above requirements are not met.

For non-responsive bids, only the contractor's name, and the reason for the non-responsiveness determination, will be announced at the letting. The Department retains non-responsive bids.

Submission of a bid is evidence that sufficient time was available to adequately prepare a bid proposal and conduct a complete investigation of the work site and all contract documents.

102.08 REJECTION OF BID PROPOSALS. The Commission reserves the right to reject bid proposals, waive technicalities, or advertise for new proposals.

A bid proposal is irregular and will be rejected as non-responsive if:

A. Failure to sign the bid bond or proposal, provided by MDT, by all specified persons, including notaries, in the correct blocks.

B. There are unauthorized additions, conditional or alternate bids, or irregularities that make the bid package incomplete, indefinite, or ambiguous.

C. The proposals for two or more projects advertised separately are connected or made contingent one upon the other so that the proposal for one project carries a provisional deduction in the bid price on one or more of the other projects.

D. Any unauthorized provisions are added reserving the right to accept or reject an award or to enter into a contract pursuant to an award.

E. More than one proposal for the same work from an individual, firm, corporation, partnership, or joint venture under the same or different name is submitted.

F. Evidence of collusion among bidders exists. Participants in collusion will not receive recognition as bidders, either singly or as a joint venture, for future Department work until reinstated as qualified bidders.
G. Bidder fails to properly complete and sign, by original signatures, on the most current Department-provided bid proposal and bid bond forms. Stamped signatures are not authorized.
H. Failure to acknowledge receipt of electronic addenda by using the correct electronic files.
I. Failure to provide a complete schedule of items, or an unverifiable schedule of items. Each sheet of the schedule of items must contain the same check number, to ensure that the unit bid prices correspond with the total.
J. The bidder does not submit all pages from the Expedite Bid EBS file.

A bid proposal is considered irregular and may be rejected as non-responsive if:
A. The Department furnished bid proposal is altered.
B. Bidder fails to include a name and mailing address.
C. The unit prices contained in the proposal are obviously unbalanced, either in excess of or below the reasonable cost-analysis value.
D. Information entered in the proposal by the bidder is not legible.
E. There are changes in the proposal such as erasures, strikeouts, and white-outs that are not initialed in ink.
F. Non-compliance with the Disadvantaged Business Enterprise (DBE) requirements.

102.09 PROPOSAL GUARANTY. Make the proposal guaranty unconditionally payable to the Department. Provide the guaranty by cash, cashier's check, certified check, bank money order, or bank draft with the bid proposal. The guaranty must be drawn and issued by a national banking association located in Montana or by any banking corporation incorporated under the laws of the State, or a bid bond or bonds executed by a surety corporation authorized to do business in the State.

102.10 DELIVERY AND PUBLIC OPENING OF PROPOSALS. Place the bid proposal in a sealed envelope plainly marked to indicate the contents. Mail or deliver to: Montana Department of Transportation, Contract Plans Bureau, 2701 Prospect Avenue, P.O. Box 201001, Helena, Montana 59620-1001.

Bid proposals are opened and read publicly at the place, time, and date specified in the "Invitation for Bids."

Deliver by the date and hour set for the opening of bid proposals to the Department officials conducting the bid opening. Bid proposals received after the specified time are returned to the bidder unopened.

The bid opening time is determined by the clock designated by the Department bid opening officials.

Mailed proposals must be received by the Department's official conducting the bid opening before the bid opening time. The Contractor is solely responsible for the proposal’s delivery.

Do not submit bid proposals by facsimile machines.

A prematurely opened bid proposal not properly addressed and identified is returned to the bidder.

102.11 WITHDRAWAL OF PROPOSALS. Submit withdrawal requests to the Department in writing or telegram before the time set for opening bid proposals. A bidder may withdraw any proposal in person or through an authorized agent before any bid proposal on that project is read.

102.12 DEBARMENT. Federal statutes and regulations adopted pursuant to federal statutes, require that any firm or individual submitting a bid on a federal aid project certify compliance with Part XI of FHWA Form 1273 (Required Contract Provisions - Federal Aid Construction Contracts) and that firm or individual will obtain and furnish the Department certification that all subcontractors, material suppliers, vendors, and other lower tier participants used are in compliance with Part XI of FHWA Form 1273.

Make certification part of each subcontract, material supply agreement, purchase order, and other covered lower tier transaction. Covered lower tier transactions include primary material purchases for contract items incorporated into the work.

The Department's debarment policies and procedures are in the Administrative Rules of Montana, beginning at Section 18.3.101.

102.13 MATERIALS GUARANTY. The successful bidder may be required to furnish a complete statement of the origin, composition, and manufacture of materials to be used in the construction of the work, together with samples to be tested for conformance with the Contract requirements. Include the costs of furnishing the statements and samples in the bid.

102.14 VACANT.

102.15 VENUE. In the event of any dispute concerning a project, whether over its advertisement, bidding, award, execution, or claim, any litigation filed by or against the Department will only have venue in Lewis and Clark County.

102.16 CONSENT TO CONTRACT PROVISIONS. The submission of a bid is an affirmative statement that the bidder and its proposed subcontractor(s) consent to all the bid package provisions upon which the bidder has submitted its bid. That consent extends to all portions of the bid package and applies to all the bidder's subcontractors. Do not submit a bid proposal unless consent to all the bid package provisions is given.

103.08 FAILURE TO EXECUTE CONTRACT Page 18 11-1-97

Rescind Subsection 103.08 and replace with the following:

103.08 FAILURE TO EXECUTE CONTRACT. Upon failure to execute the Contract and file acceptable bonds and insurance policies within 20 calendar days after receipt of the Contract, under Section 18-1-204, MCA, the award will be canceled and the proposal guaranty forfeited. Award may then be made to the next lowest responsive, responsible and qualified bidder, or the work may be re-advertised.

104.01 INTENT OF CONTRACT Page 19 11-1-97

Rescind Subsection 104.01 and replace with the following:

104.01 INTENT OF CONTRACT. Furnish all resources required to complete the work under the Contract within the specified time, and for the amount bid.

104.02.3 SIGNIFICANT CHANGES IN THE CHARACTER OF WORK Page 20 3-1-05

Rescind Subsection 104.2.3 and replace with the following:

104.02.3 Significant Changes in the Character of Work. The Engineer reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations do not invalidate the Contract nor release the surety, and the Contractor agrees to perform the work as altered.

If the alterations or changes in quantities significantly change the character of the work under the Contract, whether such alterations or changes are in themselves significant changes to the character of the work or by affecting other work cause such other work to become significantly different in character, an adjustment, excluding anticipated profit, will be made to the Contract. The basis for the adjustment must be agreed upon before the work is performed. If a basis cannot be agreed upon, then an adjustment will be made either for or against the Contractor in such amount as the Engineer may determine to be fair and equitable.

If the alterations or changes in quantities do not significantly change the character of the work to be performed under the Contract, the altered work will be paid for as provided elsewhere in the Contract.

The term "significant change" shall be construed to apply only to the following circumstances:

1. When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction; or
2. When a major item of work, as defined in Subsection 101.40, is increased in excess of 125% or decreased below 75% of the original contract quantity. Any allowance for an increase in quantity will apply only to that portion in excess of 125% of the original contract item quantity, or in case of a decrease below 75%, to the actual amount of work performed.
3. When an item of work, not defined as a Major Item in Subsection 101.40, is increased in excess of 150% or decreased below 50% of the original contract quantity. Any allowance for an increase in quantity will apply only to that portion in excess of 150% of the original contract item quantity, or in case of a decrease below 50%, to the actual amount of work performed.

104.05.4 MAINTENANCE FOR TRAFFIC DURING WORK SUSPENSIONS Page 22 3-1-00

Rescind Subsection 104.05.4 and replace with the following:

104.05.4 Maintenance for Traffic During Work Suspensions.

A. Temporary Suspension. Make passable and open to traffic all portions of the project, connections, and temporary roadways before temporary work suspensions. Maintain parts of the project, connections, temporary roadways, and detours under traffic at Contractor expense during work suspensions.

B. Winter Suspension. Be responsible for all traffic control, maintenance, and snow removal, during winter weather shutdowns, including the time between November 16th through April 15th, for all roadways not completed through the first lift of plant mix surfacing. Furnish all necessary supervision, personnel, and equipment to maintain the road in a safe condition and at the highest level of service to traffic.

The contractor may request that the department furnish all resources to perform snowplowing, sanding, de-icing and incidental work during winter suspension. This work would be detailed in a written agreement. The contractor would reimburse the department, under an accounts receivable, for all department winter maintenance expenses.

Before the winter shutdown, a contractor's representative, the District Maintenance Chief, the District Construction Engineer, and the Project Manager will review the project to develop the agreement details.

Failure to maintain the project under these requirements will invoke Subsection 104.05.2.

Repair or replace all work and materials lost or damaged due to temporary use of the project. Maintenance work for acts of God or acts of the public enemy, or that are outside the Contractor's control during work suspensions are paid for at contract unit prices or as extra work.

104.05.5 Maintenance of Traffic Control Devices During Seasonal Work Suspensions Page 22 3-1-00

Delete Subsection 104.05.5 in its entirety.

105.01 AUTHORITY OF THE ENGINEER Page 25 3-1-00

Add the following at the end of the first paragraph:

Contract time will continue to be charged during suspensions under A of this Subsection and Subsection 105.09 (2).

105.02 PLANS AND WORKING DRAWINGS Page 25 10-1-00

Rescind subsection 105.02 title and replace with the following:

105.02 CONTRACTOR FURNISHED DRAWINGS AND SUBMITTALS.

Rescind the second paragraph of 105.02 and replace with the following:

Furnish the department with contractor prepared working drawings that detail required work not included in the contract plans. Ensure all working drawings are prepared using English or Metric units as shown in the contract. Upon request submit manufacture literature describing the materials and equipment to be incorporated into the work. This requirement to submit drawings and literature applies to all items not specifically requested elsewhere in the contract.

The department has 20 working days to review the submittals before returning them to the contractor. The department has 20 working days to review drawings returned for correction and that are re-submitted for review. The department will consider extending contract time should the department review exceed the 20 working day review time limit.

105.03.2 ITEMS DESIGNATED FOR ACCEPTANCE ON A LOT BASIS Page 25 12-1-97

Rescind the first paragraph in Subsection 105.03.2 and replace with the following:

105.03.2 Items Designated for Acceptance on A Lot Basis (Quality Assurance). Contract items listed in Table 105-1 are designated for acceptance on a lot-by-lot basis. The elements in the table are evaluated and the contract items accepted under this provision. All other contract items are evaluated for acceptance under the specifications covering those items.

105.03.2 TABLE 105-2 Page 27 11-1-96

In Table 105-2, change the Factor "F" from 7 to 6 for "All Other Aggregates" for the No. 200 (0.075 mm) sieve.

105.03.3 QUALITY INCENTIVE ACCEPTANCE Page 28 2-1-04

Rescind subsection 105.03.3 and replace with the following:

105.03.3 Quality Incentive Allowance.

A. Gradation. When “Volumetric Acceptance” is not specified, a 1.05 pay factor will be applied to non-commercial plant mix surfacing lots where the results of aggregate gradation tests for the No. 4 (4.75 mm), No. 40 (0.425 mm), and No. 200 (0.075 mm) sieves are not more than one-half the allowable tolerance from the job mix target value.

A 1.05 pay factor will be applied to crushed base course Type “A” surfacing lots where the results of aggregate gradation tests for the No. 4 (4.75 mm) and No. 40 (0.425 mm) sieves are not more than one-half the allowable tolerance from the job mix target value.

B. Density.

1. When “Density Acceptance by Cores” is specified, a 1.05 pay factor will be applied to the lots of plant mix surfacing when the average density for the lot (Xn) is from 94 percent to 95 percent, inclusive, of the Maximum Specific Gravity (Rice’s Method) and the range (R) is three or less.

2. When “Density Acceptance by Cores” is not specified, a 1.05 pay factor will be applied to the lots of plant mix surfacing using the Marshall method where the average density for the lot (Xn) is from 97 percent to 98 percent, inclusive, of the target Marshall density and the range (R) is three or less.

C. Quality Incentive Allowances. Quality incentive allowances will be used to offset any price reductions. Any quality incentive allowance remaining after all price reductions have been deducted will be paid as a lump sum when all work on the item is complete. Quality incentive allowances for gradation are waived when the plan quantity of surfacing is less than the standard lot size.

105.04 COORDINATION OF CONTRACT PROVISIONS Page 28 4-1-04

Rescind Subsection 105.04 and replace with the following:

105.04 COORDINATION OF CONTRACT PROVISIONS. All documents referred to in Subsection 101.19 are essential parts of the Contract, and a requirement occurring in one is binding as though occurring in all. They are complementary and describe and provide for a complete contract. If a discrepancy exists, the governing ranking will be:

Dimensions	Information
1. Plan	1. "Question and Answer Forum" Information
2. Calculated	2. Special Provisions
3. Scaled	3. Plans
	4. Supplemental Specifications
	5. Standard Specifications
	6. Supplemental Detailed Drawings
	7. Detailed Drawings

105.05 COOPERATION BY CONTRACTOR Page 28 6-1-00

Rescind subsection 105.05 and replace with the following:

105.05 COOPERATION BY CONTRACTOR. The Engineer will furnish the contractor at least 15 sets of contract documents. Keep at least one set available on the project at all times.

Cooperate with the Engineer, Project Manager, the inspectors, and other contractors during the contract work.

Provide the Project Manager, in writing, the Superintendent's name assigned to the project before work starts.

The Project Manager or authorized representatives will issue instructions to the superintendent. Give the Superintendent the authority to execute written orders or directions of the Project Manager without delay and the ability to furnish the resources to complete the Contract.

105.06 COOPERATION WITH UTILITIES Page 29 5-1-99

Rescind Subsection 105.06 and replace with the following:

105.06 Cooperation With Utilities. Underground, overhead, and non-utility facilities will be relocated or adjusted to clear conflicts with the contract. Some or all of these facilities may be relocated or adjusted during the contract work. Perform the contract work without damaging these facilities.

Conduct on-project meetings on a weekly or biweekly basis with utility company representatives having facilities within the project limits and the Project Manager. Have the first meeting on the project before grading and excavation work begins to discuss the utility locations and progress on utility relocation work. A list of utility representatives is furnished in the contract.

Cooperate with utility owners in the removal and rearrangement of utility facilities to minimize interruption to utility service and duplication of work by the utility owner.

Submission of a bid is an affirmative statement that the Contractor has considered in the bid proposal all permanent and temporary utility facilities in the present or relocated positions as specified in the Contract and as revealed by its site investigation. No additional compensation is allowed for delays, inconvenience, or damage sustained due to interference from the utility facilities or their re-location work.

The Contract indicates utility items to be relocated or adjusted and who is to perform the work. The Contract indicates the means of adjudication, if any, if the utility owners fail to relocate or adjust the facilities.

105.08.1 BLUETOP STAKING Page 29 4-1-96

Rescind Subsection 105.08.1 and replace with the following:

105.08.1 Bluetop Staking. The Department will set construction stakes establishing lines, slopes, and profile grade for road work, excluding finish grade stakes (bluetops).

The Department will set centerline and benchmarks for culverts, protective and accessory structures and appurtenances as required. The Project Manager will furnish all necessary information relating to lines, slopes, and grades. Use these stakes and marks as the field control to perform the work.

Set all rough grade stakes required to control the work. Calculate the bluetop grades for the subgrade and each base course using the plan information.

Run a level circuit to check the project benchmarks on each roadway section being staked.

Set the finish grade stakes (bluetops) using survey personnel that are trained, experienced, and skilled in construction layout and staking. Do not hire a Department employee to perform the bluetop staking.

On typical sections using special borrow, the top of the special borrow is considered the subgrade for bluetopping purposes.

Keep survey notes in a standard field notebook, written in a clear, orderly, neat manner meeting the Department's Survey Manual requirements and standard engineering practice.

Use Department furnished field notebook paper. The Project Manager will randomly inspect the field notes for acceptance. The finished notes become the Department's property.

Perform the work meeting all Contract requirements.

Correct all deficient work due to incorrect staking and reset all bluetop stakes and reference points lost or destroyed by traffic or construction at Contractor expense.

Either of the following staking methods is acceptable.

A. Conventional Bluetopping Method.

1) Re-establish the roadway centerline.

2) Set bluetop lines at centerline and the shoulders. Set additional lines at maximum 20-foot (6m) intervals as required to produce the specified cross-section. Set lines at subgrade and the top of each course of base gravel.

3) Calculate the correct grade elevations for the subgrade and the top of each grade of base course gravel.

4) Set subgrade bluetops at maximum 100-foot (30.5m) intervals for tangent sections and 50 feet (15m) intervals for curves.

Set bluetop staking intervals for base course at maximum 50-foot (15m) for tangents and curves.

Set bluetop lines for safety shoulders, median, and shoulder ditches at 100-foot (30.5m) intervals.

5) Drive each stake top to within 0.05 feet (15mm) of the specified elevation.

6) Furnish all stakes for bluetop staking. Use stakes that are wedged shaped measuring 1½ inches by 1½ inches by 10 inches (38x38x250mm) minimum.

B. Electronic Grading Control.

1) Re-establish roadway centerline or a parallel reference line.

2) Calculate the bluetop grades for subgrade and each base gravel course from the plan information. Consult the Project Manager before setting bluetop grades for curve runoffs and ramps.

3) Set reference points and reference lines to control alignment and the grade elevations at the subgrade and the top of each base gravel course. Additional lines may be required for passing or climbing lanes, and slope or crown breaks between shoulders.

4) Set reference points and lines to produce the typical sections and ride quality specified.

5) Maintain horizontal alignment of each completed course within 0.15 feet (45mm) in 500 feet (152.5m) of the true line.

105.08.2 BRIDGE SURVEY — Page 31 — 1-1-98

Rescind the first and second sentence in the second paragraph and replace with the following:

Establish and maintain all other survey controls required to control bridge alignment and grade meeting the plan dimensions and elevations using survey personnel trained, experienced, and skilled in construction layout and staking.

105.10 B. AUTHORITY AND DUTIES OF INSPECTORS — Page 32 — 11-1-97

Rescind (B) and replace with the following:

B. To reject materials or suspend the work until the issue can be referred to and decided by the Project Manager.

Inspectors, Technicians, and Aides cannot :

1) revoke, alter, enlarge, or relax any requirements of the Contract.
2) final approve or accept any portion of work
3) issue instructions contrary to the Contract.

Add the following after (B).

Only the Engineer is authorized to make Contract changes, waive or alter the contract specifications, and then only if it is made in writing. Assure that the change, waiver, or alteration is in writing before taking action on it.

105.11 INSPECTION OF THE WORK — Page 32 — 6-1-00

Rescind subsection 105.11 and replace with the following:

105.11 INSPECTION OF THE WORK. All work is subject to Department inspection. Inspectors may not be at all work activities nor available for all work shifts for each work activity. Perform the work meeting the contract requirements regardless of inspection.

Allow the Inspector access to all parts of the work and furnish information and assistance necessary to make a complete and detailed inspection. Provide a safe environment for the Inspector during the inspections.

Inspection of the work does not relieve the contractor of its responsibility to meet the contract requirements. The inspector cannot waive contract requirements.

Remove or uncover portions of the finished work as directed. Once examined, restore the work to the contract requirements. If the work is acceptable, the uncovering, or removing and replacing the covering or making good the parts removed will be paid for as extra work. If the work is unacceptable, the uncovering, removing, and replacing the covering or making good the parts removed is at Contractor expense.

Work done or materials used without inspection by an authorized Department inspector may be ordered removed and replaced at Contractor expense.

When a government agency, political subdivision, a utility or railroad is to accept or pay a portion of the cost of the work covered by the Contract, the organization's representatives may inspect the work. The inspection does not make that entity a party to the Contract nor permit it to interfere with the rights of either party to the Contract.

105.15 ACCEPTANCE Page 33 8-1-04

Rescind Subsection 105.15 and replace with the following:

105.15.1 Vacant.

105.15.2 Final Inspection. Upon notice of completion of the entire contract, the Project Manger will arrange to make a final inspection. When all work is complete but deferment of final inspection is necessary for causes outside the Contractor's control, the Project Manager will issue a suspend work order and contract time charges will cease.

If the contract work is found satisfactorily completed, the inspection will constitute the final inspection. If the inspection discloses unsatisfactory work, the Project Manager will issue instructions to the Contractor on the necessary corrections. Immediately comply with the instructions. When the deficiencies are corrected, another inspection will be made which constitutes the final inspection.

Upon completion of the final inspection, submit to the Project Manager a completed "Contractor's Final Inspection" (Form CSB 105_15_2). The form is available from the Department's website or the Project Manager. The Contractor's project superintendent and an authorized officer of the Contractor must sign the certification, which must be sworn to and notarized. The certification will state that:

a. the Department and the Contractor have visually inspected the work, and the Contractor verifies that the work was completed in full accordance with the specifications and the requirements of the contract,

b. the Project Close-out Checklist for the Storm Water Pollution Prevention Plan (SWPPP) has been completed, all necessary corrective actions taken and the SWPPP transferred to the appropriate entity,

c. liquidated damages have or have not been assessed, and damages that have been assessed are or are not disputed by the Contractor, and

d. the Contractor is aware that the Department will not consider the contract for "final acceptance" until the Contractor has fully completed its FHWA Form PR 47, if required, required labor and materials certifications and documentation, and reviewed and agreed to the final estimate.

Completion and acceptance of the Contractor's Final Inspection is not a statement or commitment by the Department that the work meets the contract requirements, and does not waive or alter any of the contract's terms. The contract bond will remain in effect until the certificate of completion is executed and the contract is accepted by the Commission.

105.15.3 Final Acceptance. When the final estimate is accepted by the Contractor under Subsection 109.08, submit within 30 thirty days a completed "Contractor's Request and Certification for Acceptance" (Form CSB 105_15_3). The form is available from the Department's website or the Project Manager. The Contractor's project superintendent and an authorized officer of the Contractor must sign the certification, which must be sworn to and notarized. The certification will state that:

a. the work requested for acceptance has been completed in accordance with the contract's specifications, and the required materials have been used, both in quality and quantity,

b. all claims that will be made on the contract have been fully submitted in writing to the Engineer, and are current as of that date,

c. there are no pending investigations referencing alleged nonpayment to subcontractors or suppliers,

d. there are no pending labor compliance or nonpayment claims on the contract, and

e. there are no known environmental violations, and the Contractor is responsible for any violations issued for damages prior to the transfer of the SWPPP.

If any of the above is not completed in full before the certification is submitted, the Project Manager will inform the Contractor that the acceptance of the contract is rejected. If the contract receives final acceptance, a Certificate of Completion will be issued within 10 days and the final estimate submitted to Accounting for payment.

105.16 CLAIMS FOR ADJUSTMENT AND DISPUTES Page 34 8-1-04

Rescind Subsection 105.16 and replace with the following:

105.16.1 Notice of Claim. Notify the Project Manager in writing by no later than the next business day of disagreements that are to be the subject of a claim for additional compensation, time extension, contract change, or other remedy. Provide full details in the written notice why additional compensation, time extension, contract change, or other remedy is warranted. Include in the notice of claim all documentation showing the history of the disagreement.

Upon submission of the written notice, immediately begin keeping and maintaining complete and specific daily records using the Department's "Claim Cost Record" (Form CSB105_16_1) of all details and costs directly

related to the disagreement. The form is available from the Project Manager or the Department's website. Base equipment costs on internal rates for ownership, depreciation, and operating expense. Provide the Project Manager with updates of details and costs related to the disagreement as they develop.

Failure to timely provide the written notice as required waives the Contractor's right to make any claim for the disagreement. Ensure that any notice of disagreement is fully and completely explained and documented, as the Department expects and requires early notice to mitigate costs and to fully document any potential costs.

The Project Manager will attempt to resolve the disagreement after the written notice is submitted. The Project Manager will issue a written response no more than 14 calendar days after receipt of the written notice.

105.16.2 Submission of Certified Claims. If an agreeable resolution is not reached within 14 calendar days of the written notice, the Contractor may submit a Certified Claim using the "Certified Claim" (Form CSB105_16_2) to the Project Manager no more than 7 calendar days after receipt of the Project Manager's response. The form is available from the Project Manager or the Department's website. Include all Claim Cost Records to date with the Certified Claim. Provide copies to the District Construction Engineer and the Construction Engineering Services Engineer of the Engineering Division. The Project Manager will continue to attempt to resolve the disagreement after the Certified Claim is submitted.

Detail the following in the Certified Claim:

A. Reasons for each requested remedy, referenced to the applicable Contract provisions;
B. Objections to the Project Manager's response;
C. Basis for and amount of any additional compensation, extension of time, contract change, or other remedy, including any potential solutions.

The prime contractor must verify the claim data and certify the claim, whether originating from the prime contractor, subcontractor, supplier or materialman, for the Department to consider it. Only the prime contractor may submit the Certified Claim.

Failure to timely submit the completed Certified Claim form and the Claim Cost Records as required is a material breach of contract and waives the Contractor's right to make any claim for the disagreement or be entitled to any compensation, time extension or contract change related to the disagreement.

Allow the Project Manager access to and provide copies of all records when requested by the Department. Make other project records available for technical and audit evaluation during the project and after the claim-related work has been performed. Promptly furnish written clarification and any additional information or data requested by the Department.

After the Certified Claim is submitted, continue keeping and maintaining complete and specific daily records using the Department's "Claim Cost Record" form of all details and costs directly related to the claim. Base equipment costs on internal rates for ownership, depreciation, and operating expense.

Submit claim updates every month until the claim is resolved. Include all costs incurred and any other pertinent information discovered after the Certified Claim was submitted, and include copies of all Claim Cost Records for that month.

Do not change the basis of a claim after submitting the written notice. Do not supplement a faulty submission to rebut or dispute a decision made by the Project Manager. Claims that have changed in basis or that have been supplemented due to an original faulty submission will not be considered, and are waived by the Contractor.

The Contractor waives the claim and any compensation, time extension or contract change by:

A. Not filing a timely, complete written notice;
B. Not submitting a timely and complete Certification of Claim form;
C. Not submitting monthly claim updates as required;
D. Not keeping and submitting timely and complete Claim Cost Records.

105.16.3 Decision on Claims. The District Construction Engineer will provide a written decision no more than 30 calendar days after receipt of the Certified Claim. If additional time is required to research and evaluate the Claim, the District Construction Engineer can extend the time period 14 calendar days by notifying the Contractor in writing.

To advance the claim, appeal the District Construction Engineer's decision to the Board of Contract Appeals (Board). Submit the appeal by letter to the Construction Engineering Services Engineer no more than 30 calendar days after receipt of the District Construction Engineer's decision. Provide a copy of the appeal to the District Construction Engineer. The District Construction Engineer's decision is final unless appealed no more than 30 calendar days after receipt of the decision. If appealed, the District Construction Engineer will forward the original claim, supporting documents or evidence, and the District's evaluation to the Construction Engineering Services Engineer.

If the District Construction Engineer denies the Certified Claim, the Contractor may request a non-binding, independent third party mediation to the Construction Engineer of the Engineering Division. The request for third party mediation must be submitted in writing no more than 30 calendar days after the date of the Contractor's appeal. The Contractor and the Construction Engineer must mutually agree to the mediator and schedule the mediation date within 14 days of the request for mediation or the claim will proceed to the board. All costs associated with mediation will be shared equally between the Contractor and the Department. Mediation does not suspend the contractor's requirement to continue submitting monthly updates and maintaining the required cost records. Claims undergoing third party mediation will not be submitted to the Board unless the mediation is unsuccessful.

The Construction Engineering Services Engineer will submit the claim to the Board. Board meetings are scheduled on a quarterly basis, with the schedule available on request from the Construction Engineering Services Engineer. Claim appeals received less than 60 days in advance of the next scheduled Board meeting may not be presented to the Board until the following scheduled meeting.

The Board will only review those documents and evidence submitted in the original claim, its supporting documents, and the District's evaluation, but may request further information from the District Construction Engineer or the Contractor.

The Board may affirm, overrule, or modify, in whole or in part, the decision of the District Construction Engineer. The decision of the Board is the final decision.

105.17 PARTNERING Page 35 11-1-97

Add the following after the second paragraph:

The Partnership Charter does not change any legal relationship of the parties to the Contract nor does it relieve either party of any terms of the Contract. The claims procedure under Subsection 105.16 (e.g., Notice of Potential Claim, written formal claim, daily records and required claim updates) must be timely followed by a Contractor concurrently with the issue-escalation process of the Partnership Charter. The Contract's claims procedure is not affected by the partnering process.

105.17 F. PAYMENT Page 36 11-1-97

Delete the last sentence in F. Payment.

106.01 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS Page 37 8-1-99

Add the following sentence under the heading:

The Contract specifies the basis of acceptance for materials and assemblies.

106.01.1 SOURCE OF SUPPLY Page 37 8-1-99

Add the following after the first sentence:

Provide the Materials Bureau Quality Control Section a list of the names and addresses of the suppliers, producers, manufacturer’s and fabricators furnishing products for the contract. Itemize the list as shown in the contract schedule of items. Submit the list at least 30 calendar days before incorporating a listed item into the work.

106.01.2 SAMPLES, TESTS, CITED SPECIFICATIONS Page 37 3-1-05

Rescind subsection 106.01.2 and replace with the following:

106.01.2 Samples, Tests, Cited Specifications.

A. Materials accepted by Certification.

Ensure all required certifications for materials are furnished to the Department and the Department has inspected and accepted the certification before incorporating the materials into the work.

The Project Manager may grant written permission to place materials before receiving certifications for materials only under the following conditions:

- Not placing the materials poses immediate danger to traffic or the general public;
- Not placing the materials would cause a delay in the work resulting in damage to the project or adjacent property.

The Project Manager may require that materials be removed and replaced at contractor expense if the certification(s) are not furnished.

B. Materials accepted by Department Testing.

Do not incorporate material into the work until it is inspected or sampled by the Department.

Reference to a specification or test designated in AASHTO, ASTM, Federal Specifications, or other recognized, nonproprietary national organization, is the specification or test method that is current on the date of advertisement for bids and as amended by the Department's Test Method Manual. Copies of individual test methods are available from the Department's Materials Bureau in Helena.

Department material tests are by and at the Department's expense. Where there is a difference in the test methods, the order of precedence for tests will be:

(1) The Department's Standard Material Test Methods in the Materials Manual
(2) AASHTO
(3) ASTM

Submit representative preliminary material samples in the specified quantities for testing upon request. The testing of preliminary samples does not constitute acceptance of the materials. Only materials delivered for incorporation into the work will be accepted or rejected based on the test results specified in the Contract.

106.02.3 CONTRACTOR-FURNISHED SOURCES Page 38 8-1-04

Rescind subsection 106.02.3 and replace with the following:

106.02.3 Contractor-Furnished Sources. Acquire the rights to take materials from contractor-furnished sources and pay all related costs, including costs due to increased haul length, exploring and source development.

Ensure the material meets all statutory and regulatory requirements for being non-toxic and non-hazardous. Do not furnish material from mine tailings and waste, slag, sources within state and federal superfund sites, or sources within areas known or suspected to be contaminated with toxic substances or petroleum products unless laboratory reports from an approved laboratory indicate the material meets these requirements.

The Department will process and test samples to determine the suitability of the material. See Subsection 106.10 for the number of department furnished tests at Department expense.

Arrange with the Project Manager for representative samples to be taken and witnessed by the department at least 30 calendar days before beginning aggregate production. Provide all equipment and labor necessary for the sampling.

Source approval is based on part or all the following sample test results :

A. Wear Test MT-209 (acceptance);
B. Volume Swell Test MT-305 (acceptance);
C. Trial Mix Marshall Properties MT-306 (informational);
D. Resistance of Compacted Asphalt Mixtures to Moisture-Induced Damage AASHTO T 283-02 (MT-330);
E. Adhesion MT-322 (informational).

Passing wear and volume swell test results are mandatory for department approval of bituminized material aggregate sources. Passing wear test results are mandatory for department approval of untreated aggregate sources.

Assume all risk for producing aggregate from sources not meeting the wear test (MT 209) . The department will randomly test stockpiled aggregate for wear acceptance.

The departments approval of the source does not release the Contractor from the responsibility to produce aggregate meeting all specified acceptance requirements.

106.02.5 RECLAMATION REQUIREMENTS Page 39 2-1-98

Rescind the second paragraph of A. General, and replace with the following:

The Department of Environmental Quality has final responsibility for administration of the Open Cut Mining Act and the Hard Rock Mining Act and must review and approve all reclamation plans and reclamation work. Follow all directives and instructions issued by the Department of Environmental Quality with regard to reclamation work.

Rescind B. Reclamation Plan, and replace with the following:

B. Reclamation Plan. Submit a copy of the approved reclamation plan to the Project Manager before removing earth, quarried rock, sand, gravel, or other substance from any materials source. Follow the Department of Environmental Quality "Format For Reclamation Plan" and "Mapping Guidelines" when developing reclamation plans. The format and guidelines are available from:

Department of Environmental Quality
Permitting and Compliance Division
Industrial and Energy Minerals Bureau
Open Cut Mining Section
P.O. Box 202301
Helena, MT 59620-2301
Phone: (406)444-3920

The time allowed for approval of reclamation plans is included in the Open Cut Mining Act, Section 82-4-434, MCA.

106.03 CERTIFICATION OF COMPLIANCE Page 40 8-1-99

Rescind the first paragraph and replace with the following:

The Engineer may designate certain materials or assemblies that can be incorporated into the work by Certificates of Compliance stating that they meet the Contract requirements. Ensure the certificate is signed by a manufacturer’s authorized representative. Clearly identify each lot of certified materials or assemblies delivered to the work in the Certificate of Compliance.

107.01 LAWS, RULES AND REGULATIONS TO BE OBSERVED Page 43 11-1-97

Add the following after the second paragraph:

Ensure compliance with and enforce all federal, state, and local safety standards (i.e. the Montana Scaffolding Act, etc.) for Contractor's workers and its subcontractor's workers on the project, protecting and indemnifying the Department and its representatives from all claims, suits, damages or liabilities from all accidents or safety violations, and ensuring the publics safety. The Contractor is not to enforce safety standards for Department employees.

107.02 PERMITS, LICENSES AND TAXES Page 43 11-1-97

Rescind Subsection 107.02 and replace with the following:

107.02 PERMITS, LICENSES, AND TAXES. Obtain all legally required permits and licenses, pay all charges, fees, taxes, and fuel taxes giving all notices necessary and incidental to the lawful prosecution of the work.

107.10 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE Page 46 6-1-97

Add the following paragraph at the end of Subsection 107.10

Conduct a review of all public roadways to be used by Contractor equipment, including haul operations, before work begins. Arrange for a local road authority representative and the Engineering Project Manager to attend the review.

The parties are to review and document the roadways existing condition and determine a dispute resolution process if an agreement on roadway restoration cannot be reached.

Once the roadway is no longer in use by the Contractor, conduct another review by the same parties. The parties are to reach an agreement on what is required to restore the roadway comparable to its original condition.

Perform all work required to restore the roadway comparable to its original condition and obtain the Engineer's approval of the work once completed.

Roadway restoration is not measured for payment.

107.13.1 INSURANCE ON ALL CONTRACTS Page 48 5-1-98

Revise Subsection 107.13.1 as follows:

Add the following sentence to the first paragraph:

Obtain insurance from an insurer with a Best rating of A- or better on the date the policy is written.

Add the following after C.

D. Provides that all insurance or self insurance maintained by the State, its agents, employees, and officers is excess of the Contractor's insurance and does not contribute with it.

Add the following as the last paragraph:

The insurance requirements are a condition precedent to the Contract. Failure to obtain and maintain all required insurance, or permitting the insurance to lapse before the contract is complete and accepted is considered a material breach of the Contract.

107.13.3 INSURANCE ON CONTRACTS INVOLVING UTILITY PROPERTY AND SERVICES Page 49 5-1-99

Rescind this subsection in its entirety.

107.17 CONTRACTOR'S RESPONSIBILITY FOR WORK Page 50 8-1-04

Rescind the fourth paragraph and replace with the following:

The above requirements do not apply to units or portions of the project accepted under Subsection 105.15.

Change the term "retained percentages" to "unpaid contract funds" in A.

107.18 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTY AND SERVICES Page 50 5-1-99

Rescind subsection 107.18 and replace with the following:

107.18 Contractor's Responsibility for Utility Property and Services. Protect railway, telegraph, telephone, and power companies property or other property from damage, loss or inconvenience from construction before starting work. Cooperate with the utility owners in the removal and rearrangement of underground or overhead utility lines or facilities to minimize interruption to service and duplication of work by the utility owners.

Call the Utilities Underground Location Center (1-800-424-5555) or other notification system for the marking and locating of the utilities before excavation. Do not damage underground facilities during excavating and backfilling work.

Obtain and carry a $2,000,000.00 comprehensive insurance policy covering underground work and resulting damage to underground utilities in addition to the insurance required by Subsection 107.13.

Provide and maintain temporary drainage facilities if existing surface drainage, sewers, or underdrains are interrupted at Contractor expense until permanent drainage facilities are completed. Protect and preserve existing tile drains, sewers, other subsurface drains, conduits, and other underground structures affected by construction that can remain in use without any change.

Immediately stop work if a utility line, cable, pipe or other facility is exposed or damaged during the work. Notify the Project Manager and the utility company of the damage and its location. Cooperate with the utility company if utility services are interrupted due to an accidental break until service has been restored. The Project Manager will stop work in the area of the damaged utility should the contractor not stop work voluntarily. Resume work upon notice from the Project Manager. No compensation is made for delays associated with utility damage caused by the contractors work.

The department will withhold monies from estimates due or to become due the contractor for all utility damage and related costs not reimbursed by the contractor under this subsection.

Do not begin work around fire hydrants until provisions for continued service have been made and approved by the local fire authority. Provide continuous repair until service is restored if water service is interrupted.

Repairs to damaged utility facilities or structures resulting from construction operations and negligence is at Contractor expense. Be responsible to the utility owners and operators for damage, injury, expense, loss, inconvenience, delay and for any legal suits, actions, or claims that may result from the work.

The Commission may require the Contractor to furnish protective public liability and property damage insurance to each corporation, company, partnership, or individual owning or operating the properties affected.

107.23 DISCOVERY OF UNDERGROUND STORAGE TANKS Page 53 9-1-95

Delete the following under B.:

Underground Storage Tank Program
Department of Health and Environmental Sciences
Solid and Hazardous Waste Bureau
Cogswell Building, Room B201
Helena, MT 59620
(406) 444-5970

And replace with the following:

Underground Storage Tank Program
Department of Environmental Quality
Environmental Remediation Division
Corrective Action Program
2209 Phoenix
Helena, MT 59620
(406) 444-5970
1-800-457-0568

Rescind C. and replace with the following:

Immediately protect people and property from fire, explosion, vapor, and other potential hazards and, prevent further release of the tank's contents. Take all actions requested by the Project Manager and the Underground Storage Tank Program personnel.

107.25 ACCESS TO CONTRACTOR RECORDS Page 53 11-1-97

Rescind Subsection 107.25 and replace with the following:

107.25 ACCESS TO CONTRACTOR RECORDS. Allow access by the Department or its authorized representative, and the FHWA to all project records, and the project records of all subcontractor's, under Section 18-1-118 MCA, by the Legislative Auditor and Legislative Fiscal Analyst to determine compliance with the contract terms.

107.27 DIESEL FUEL USED ON THE PROJECT Page 54 3-1-00

Add the following new subsection:

107.27 Diesel Fuel Used on the Project. Use taxed clear fuel as required by State law to construct the project.

Violation of state law will result in a six-month suspension of the violating firm from participation in Department contracts not already awarded on the date of suspension. Prime contractors are responsible for compliance of their own equipment, and the equipment of all subcontractors and their sub-contractors.

108.01 ASSIGNMENT OR SUBLETTING OF CONTRACT Page 55 4-1-96

Rescind Section 108.01 and replace with the following:

108.01 SUBCONTRACTING OR ASSIGNMENT OF CONTRACT.

108.01.1 Subcontracting. Do not subcontract, assign, or otherwise dispose of more than 60% of any portion of the Contract cost without the written consent of the surety and the Department.

Include in the written subcontract or assignment or in a separate written document with the subcontract or assignment the following language:

"In consideration of being awarded this subcontract, and in consideration of having this subcontract approved by the State of Montana, the Subcontractor hereby assigns to the State of Montana any and all claims or causes of action for any antitrust law violations, or damages arising therefrom, as to goods, materials, and services purchased under the terms of this subcontract or any change order that may result from this subcontract."

108.01.2 Contract Performance. Perform at least 40% of the Contract cost with the Contractor's organization. Designated Contract "Specialty Items" may be performed by subcontract without regard to the 40% limitation.

Where an entire item is subcontracted, the percentage of the total work subcontracted is based on the contract item bid price. When a portion of an item is subcontracted, the percentage of the work subcontracted will be based on either the subcontract item unit price or on an estimated percentage of the contract item bid price, determined by the Engineer.

Do not allow a subcontractor to start work until its subcontract is consented to by the Construction Engineer in Helena. Include two executed and certified copies of the subcontract, a letter from the surety consenting to the subcontract, and a copy of the proposed subcontractor's current special fuel users permit issued under 15-70-302, MCA.

Do not subcontract or assign more than the allowable 60% by including additional labor, equipment, and supervision costs on the Contractor's payroll records to circumvent the subcontracting provisions.

Inform the subcontractor of all the Contract provisions. The minimum wage included in the Contract applies to labor performed on all work subcontracted, assigned, or otherwise disposed of.

Attach to each subcontract all required Contract provisions and predetermined minimum wage rates. Include in the subcontract these words: "The subcontractor agrees to comply with all of the labor provisions contained in the attached "Special Required Contract Provisions" and "Minimum Wage Determination."

All subcontractors are agents of the Contractor. The Contractor is responsible for all work, material furnished, and indebtedness incurred by the subcontractor.

Written consent to subcontract, assign or transfer the Contract does not release the Contractor from liability under the Contract and bond.

108.02 NOTICE TO PROCEED Page 55 9-1-95

Add the following after the first sentence:

Do not begin actual work nor permit subcontractors to begin work until all subsection 103.07 requirements are met.

108.03 PROSECUTION OF WORK Page 56 11-1-04

Rescind Subsection 108.03 and replace with the following:

108.03 PROSECUTION OF WORK.

108.03.1 General. Begin obtaining all air quality, water quality and storm water runoff permits, approval of reclamation plans, and archaeological and historical clearances immediately upon receipt of the notice of contract award letter from the Department. Furnish the Project Manager two (2) copies of the completed applications to secure permits, approvals or clearances as they are submitted to the respective agency. Furnish two (2) copies of approved permits, reclamation plans and clearances necessary to complete the work in conformance with all Federal, State and Contract requirements.

The Department will reimburse all reasonable costs incurred in securing the permits, approvals and clearances if the Department does not execute the contract for reasons outside its control.

A pre-construction conference will be held on a mutually agreed date between the Contractor, Department and other parties interested in the work before work within the project limits begins. The Contractor's superintendent in charge of the project must attend the conference. Encourage subcontractors to attend. A pre-construction conference will not be scheduled or held and no work (other than obtaining permits) may begin until the Project Manager approves the schedule meeting all requirements of Subsection 108.03.2.

Obtain the Project Manager's written approval before starting night work. Provide work area flood lighting for night work and do not rely solely on equipment lights. Night work approval may be rescinded at any time.

Suspending and resuming work on all or a part of the Contract will be by Subsection 105.01.

Work may be suspended on working day contracts for unsuitable weather or for other conditions that are detrimental to the work accuracy and quality. Prevent damage and repair damaged work that was not protected during the suspension at Contractor expense. No time extensions will be approved for work to correct non-protected work.

Store materials to protect against damage and without obstructing, endangering or impeding traffic.

Do not allow water to pond on the roadway or within the construction limits, excluding environmental protective devices. Open ditches and shoulder drains, and take other actions to protect the public and the work.

The Department does not authorize project suspension by the Contractor and time will be charged during unauthorized project suspensions. If the Contractor suspends the project, provide written notification of the suspension to the Project Manager seven (7) calendar days before the suspension. The Contractor is responsible for all maintenance required during unauthorized suspensions and for all work and materials required due to the suspension.

108.03.2 Project Schedules. For projects not subject to Subsection 108.03.3 CPM requirements, submit to the Project Manager within twenty (20) calendar days after Contract Award Date:

a. Two (2) copies of an Activities Schedule Chart (ASC).
b. Two (2) copies of a Written Narrative (WN) that details the work and time (working days, calendar days or completion date) to complete the contract.

The Contractor may use a Critical Path Method (CPM) schedule as the ASC if it meets the requirements described in Section 108.03.2 herein and results in no additional cost to the Department.

A. Include in the ASC:
1. A bar chart chronologically sequenced and to time scale showing the following:
    a. All work activities with a completion duration of five (5) or more working days. (For this requirement, “working days” does not exclude the period from November 16 through April 15.)
    b. Any work activity that has an impact on completion of the project.
2. The relationship of each work activity listed in Section A.1. herein to other work activities, permits, plans, submittals and approvals required to complete the project.
3. Work activity durations by working days or calendar days as appropriate. Note non-working periods exceeding three days on each activity bar.

B. Include in the WN:
1. The proposed work process sequence describing the relationship of the work activities listed in Section A. herein required to complete the Contract, including shop drawing submittals, permits (including estimated maximum waiting periods for all required permits), fabrication and delivery activities.
2. A detailed description and the progress time of each work activity listed in Section A. herein, measured by working day or calendar day, as appropriate;
3. A detailed description of the ASC, including holidays, planned workdays per week, number of shifts per day, hours per shift, size of work crews and resources used.

Submit two (2) copies of an updated ASC and WN to the Project Manager every month in which work is performed, one week before the end of the project’s monthly estimate cycle. The ASC and WN should show current progress and all revisions or modifications that reflect changes in the method or manner of the work, specification changes, extra work, changes in duration, changes in shifts, work crews or resources. If the work is not proceeding consistent with the Contractor’s most recent ASC and WN, the Project Manager may require that the Contractor submit two (2) copies of an updated ASC and WN that accurately reflect the Contractor’s progress, resource allocation for the project, and revised schedule. Submit the updated ASC and WN within one (1) working day of the Project Manager’s request. It is the Contractor’s responsibility to ensure that the WN and ASC submitted meet the above requirements and accurately reflect the work’s progress. The Project Manager may suspend work under 105.01.A. if the WN and ASC do not accurately reflect the actual progress of the work; the suspension may continue until accurate WN and ASC are submitted.

Any delay in beginning or prosecuting work that is caused by the Contractor’s failure to provide an ASC or WN when and as required is solely the responsibility of the Contractor, and is not an excusable delay.

Prosecute the work with the resources required to complete the Contract within the time shown in the Contractor’s updated ASC and WN.

The Department may withhold ten percent (10%) of each monthly progress estimate for failure to submit an original or updated ASC or WN on time and in the manner required. Payment withheld for violation of the schedule requirements will be included in the next progress estimate following the Contractor’s submission of the required ASC and WN. The Project Manager’s approval does not attest to the validity of the ASC or WN.

108.03.3 Critical Path Method (CPM) Scheduling. When requested, furnish one workstation copy of a computer software package compatible with Windows© operating systems to produce a Critical Path Method (CPM) Schedule for the contract work. Payment for the workstation copy of the computer software package will be made at invoice cost. Schedule all contract work including that of subcontractors, vendors and suppliers.

Prepare the initial CPM schedule as an activity on node (AON) or Precedence Diagramming Method (PDM).

The Project Manager may withhold ten percent (10%) of each monthly progress estimate for failure to submit an original or updated CMP schedule on time and in the manner required. Payment withheld for violation of the schedule requirements will be included in the next progress estimate following the Contractor’s submission of the required CPM schedule. The Project Manager’s approval of the CPM schedule does not attest to the validity of the Contractor’s assumptions, logic constraints, dependency relationships, resource allocations, labor and equipment or other schedule aspects.

A. Preparation and Submission of Schedule. Prepare an initial schedule and submit a disk with the software package used to develop the CPM schedule and one ANSI D (24-inch by 36-inch) paper copy to the Project Manager within twenty (20) calendar days after receiving the notice of contract award letter from the Department. Submit all items listed in Item C herein.

Attend a meeting scheduled by the Project Manager within ten (10) calendar days of the Project Manager’s receipt of the CPM schedule to review, correct or adjust the CPM schedule if required.

Make all schedule adjustments and corrections discussed at the meeting and re-submit a disk with the revised schedule within fifteen (15) calendar days after the meeting. Plan and execute the work to meet project milestones and completion dates.

B. Initial Schedule Requirements. Include the requirements listed in Item C herein and the following:

1. Total Float Sort; Responsibility/Early Start Sort; Area/Early Start Sort.
2. 60-day look ahead bar charts by early start.
3. Logic diagram having a maximum 100 activities for each ANSI D (24-inch by 36-inch) size sheet. Ensure each sheet includes project number, page number, title, match data or diagram correlation and key to identify all components used in the diagram.

C. Schedule Requirements. Ensure all schedule submissions include:

1. Activity identification numbers.
2. Activity descriptions.
3. Finish to start relationships with no lead or lags.
4. Activity durations of not more than twenty (20) working days and not less than one (1) working day unless otherwise approved by the Project Manager. Submit activity manpower, equipment, unit quantities and production rates to the Project Manager for review.
5. Material procurement separated into at least two activities, fabrication and delivery. Include time for delivering all submittals and thirty (30) calendar days for Department review of working drawing submittals as separate items in the schedule logic for all items requiring submittal, review and approval.
6. Activities coded to reflect the party performing each activity (only one party performs each activity) including subcontractors and suppliers and the area/location of each activity.
7. Work days per week, holidays, number of shifts per day, hours per shift and major equipment to be used.

Use only contractual restraints in the schedule logic. Do not use any other schedule restraints such as activity mandatory start and finish dates or mandatory zero float constraints.

Float is defined as the amount of time between when an activity “can start” and when it “must start”. Float is a shared commodity, not for the exclusive use or financial benefit of either party. Either party has the full use of float until it is depleted.

Ensure the schedule shows the sequence and interdependence of all activities required for the complete performance of all items of work under this contract, including acquiring all the environmental permits. Show all network "dummies" on the diagram.

The Department reserves the right to limit the number of activities on the schedule to between 50 and 500 activities.

Ensure the activities are described so that the work is identifiable and the progress on each activity is measurable.

D. Schedule Updates and Progress Payments. Schedule and attend monthly project progress meetings to compare the schedule to the actual finish dates of completed activities, the remaining duration of uncompleted activities and the proposed logic and/or time estimate revisions. Provide the status of activities at these meetings, and the schedule updates based on this information, once it has been verified.

Each month of the project, one week before the end of the project’s monthly estimate cycle, submit a schedule on disk containing:

1. An updated I node-J node sort;
2. Total Float Sort;
3. A narrative report describing the critical path, logic revisions or modifications to the schedule, including, but not limited to: changes in the method or manner of the work, changes in specifications, extra work, changes in duration, etc.

Also include on the disk any revised activity on node diagrams for the following:

1. Delay in the completion of any critical activity;
2. Actual prosecution of the work that is different than that represented on the CPM schedule;
3. The addition, deletion, or revision of activities required by contract modification(s), or logic revisions.

The contract time will be adjusted only as specified in the contract. Furnish documentation to support requests for time extensions for milestone dates or the contract completion date.

108.03.4. Method of Measurement. CPM schedule is measured as a lump sum. Other scheduling requirements are not measured for payment.

108.03.5 Basis of Payment. Payment for all costs associated with CPM scheduling is included in the lump sum price bid for Critical Path Method (CPM) Scheduling. Payment for all costs associated with other scheduling requirements is included in the payment for other items of work.

The Department may withhold ten percent (10%) of each monthly progress estimate for not submitting the monthly schedule updates as required. Payment withheld for violation of the schedule requirements will be included in the next progress estimate following the Contractor’s submission of the required schedule.

Partial Payment. The following percentages of the total lump sum price bid for CPM scheduling will be paid:

50% When the initial schedule is finalized.
75% When the overall project is 50% complete.
100% When all updates have been submitted.

108.07.1 CALENDAR DAY CONTRACTS Page 58 8-1-04

Rescind the second to the last paragraph and replace with the following:

The actual completion date is the date the Engineer accepts the project as complete under Subsection 105.15.3.

108.07.5 DELAY COMPENSATION Page 60 8-1-04

Add the following at the beginning of the first paragraph:

Requests for any compensation for delay under this provision must fully comply with the provisions of Subsection 105.16, in addition to the following requirements.

108.08 FAILURE TO COMPLETE ON TIME Page 61 10-1-04

Rescind Table 108-1 and replace with the following:

TABLE 108-1
SCHEDULE OF LIQUIDATED DAMAGES

ORIGINAL CONTRACT AMOUNT		DAILY CHARGE
From More Than	To and Including	Working Day or Calendar Day
$0	$50,000	$478
50,000	100,000	618
100,000	500,000	967
500,000	1,000,000	1,171
1,000,000	2,000,000	1,505
2,000,000	5,000,000	2,341
5,000,000	10,000,000	2,804
10,000,000	—	3,379

Rescind the second sentence after Table 108-1 and replace with the following:

The Commission may waive such portions of the liquidated damages as may accrue after the work is substantially complete (e.g., a few punch list items to be completed) and in condition for the safe and convenient use by the traveling public. If the Contractor disputes the liquidated damages on the accepted “Contractor’s Final Inspection” form, the Construction Administration Services Bureau will send a final notification in writing to the Contractor of the number of days to be assessed and the dollar amount of proposed liquidated damages. Submit any objections of the assessment to the Construction Administration Services Bureau in writing within thirty days of receipt of the Department's notification. Include with the objection the justification and all information to support an adjustment to the assessment. The Department will review the Contractor's information, incorporating it into the Department's recommendation to the Commission. The Construction Administration Services Bureau will provide a copy of the Department’s recommendation within forty-five days of receipt of the objections to the Contractor. The Contractor must state in writing within fourteen days of receipt of the Department’s recommendation if an appearance before the Commission is requested. If an appearance is requested, the Department will notify the Contractor in writing of the date the Commission will review the liquidated damages recommendation. The Commission will not receive or hear new information at the meeting not already furnished in the Contractor's original response.

108.10.2 PAYMENT Page 62 11-1-97

Rescind the last sentence in Subsection 108.10.2 and replace with the following:

Make all project records available to verify the claim.

108.10.3 RESPONSIBILITY OF THE CONTRACTOR AND SURETY Page 63 11-1-97

Rescind Subsection 108.10.3 and replace with the following:

108.10.3 Responsibility of the Contractor and Surety. Termination of a contract does not relieve the Contractor of any contractual responsibilities for the work nor the Surety or Sureties of the obligations under the contract bond for the work performed.

109.01 MEASUREMENT OF QUANTITIES Page 65 8-1-04

Add the following after the second paragraph:

Metric measurements are given in the System International (SI). Metric abbreviations in the Contract are as follows.

Millimeter – mm	Meter - m
Kilometer – km	Square Meter - m²
Cubic Meter - m³	Kilogram - kg
Metric Ton – t	Liter - L
Kiloliter – kL	Hectare - ha
Course Kilometer – cr km	Kilometer Cubic Meter- km m³
Metric Ton Kilometer - t km	

Rescind the 8th paragraph of Subsection 109.01 and replace with the following:

Computing excavation volumes will be by the average end area method or by alternate methods involving three-dimensional measurements (delta surface).

109.01.1 WEIGHING EQUIPMENT Page 66 1-1-96

Rescind number 2 and replace with the following:

2. One-half percent of the correct weight.

109.01.2 METRIC ABBREVIATIONS IN THE SCHEDULE OF ITEMS Page 66 3-1-00

Add the following new subsection:

109.01.2 Metric Abbreviations in the Schedule of Items. The Department uses the following abbreviations in the Schedule of Items for the respective metric units of measurement:

Metric Unit of Measure	Abbreviation
Millimeter	MM
Meter	M
Kilometer	KM
Square Meter	M2
Cubic Meter	M3
Station (100 Meters)	STA
Kilogram	KG
Metric Ton	MT
Liter	L
Kiloliter	KL
Hectare	HA
Course Kilometer	CR KM
Kilometer Cubic Meter	KM M3
Metric Ton Kilometer	MT KM

109.02 SCOPE OF PAYMENT Page 67 9-1-00

Change the term “retained percentages” to “unpaid contract funds” in the third paragraph.

109.06 PARTIAL PAYMENTS Page 70 9-1-00

Delete the third and fourth paragraphs.

Revise the fifth paragraph to read as follows: If the Contractor becomes delinquent in any monetary contractual obligations (e.g., prompt payment upon satisfactory completion of work, payment to owners of materials sources, etc.), the Department may withhold unpaid contract funds from each monthly estimate thereafter until the delinquency is resolved or the amount of the delinquency has been withheld. The amount of the withholding will not exceed the amount of known delinquency but, depending on the amount of the delinquency and the amount of the monthly estimate, may be in the full amount of that monthly estimate. In the event the delinquency involves nonpayment to a subcontractor, supplier or materialman, the department also may order forfeiture of the contract bond, or take action under subsection 108.09.

The Department will release the withheld amounts to the contractor upon the Engineer's receipt of a notarized statement from the entity to whom the delinquency was owed stating that the delinquency has been satisfied in full or, in the event the entity has received partial payment of the delinquency, that portion of the withheld amount may be released.

109.07 PAYMENT FOR MATERIAL ON HAND, TABLE 109-2 Page 71 2-1-01

Add the following items to Table 109-2, and the sentence's at the end of the table:

Table 109-2 Materials in Storage Eligible for Payment

MATERIAL	PERCENT OF QUANTITY FOR PARTIAL PAYMENT
Pavement Marking Paint	50%
Glass Beads for Paint Striping	10%
Epoxy Pavement Marking Material	40%
Glass Beads for Epoxy Striping	20%
Prestressed Concrete Beams	75%
Bridge Elastomeric Bearing Devices	10%
Bridge Pile	
Pipe Pile	60%
H Pile	60%
Monotube	70%
Bridge Pile Tips and Cutting Shoes	5%
Bridge Joint Seals	50%
Bridge Deck Re-Surfacing Materials	30%

Obtain the Engineer's written approval of off-project site storage locations for bridge prestressed beams, bridge structural steel members, concrete box structures, and other large structural items.

No payment is made for bridge deck re-surfacing materials having a manufacturer's expiration date passing before its scheduled incorporation into the work.

109.08 FINAL ESTIMATE Page 72 8-1-04

Rescind Subsection 109.08 and replace with the following:

109.08 Final Estimate. When the final inspection of the contract is complete under Subsection 105.15.2, the contract documents will be finalized and a final estimate will be prepared. The estimate will include the amount and value of each class of work performed and any extra work and materials. Deductions for all previous payments and amounts to be deducted or withheld under the provisions of the contract will be made in the final estimate. Errors made in previous partial payments will be corrected in the final estimate.

When the final estimate is complete and all required documentation (e.g., material certifications, labor dispute resolutions, FHWA Form 47, etc.) has been received, the Construction Administration Services Bureau will send a copy of the final estimate to the Contractor for review. The Contractor has thirty days to dispute the final estimate or submit the request for acceptance under Subsection 105.15.3.

To dispute the final estimate, submit the items disputed and justification to the Construction Administration Services Bureau. Provide a copy to the Project Manager. The Construction Administration Services Bureau will provide a written decision on the disputed estimate within 30 calendar days of receipt of the disputed items.

The Department reserves the right to withhold all or part of the final payments earned under the contract until all taxes and assessments due and owing to the State of Montana for any reason have been paid in full unless a written release is received from the Department or the state agency having a claim against the Contractor.

The statutory time for filing claims against the contract bond is 90 calendar days from the date of the Commission acceptance of the project. See 18-2-201 to 18-2-208, MCA.

The Engineer will immediately notify the Contractor and its surety of all claims filed against the contract or bond.

109.11 FUEL PRICE ADJUSTMENT Page 74 3-1-00

Add the following new subsection:

109.11 Fuel Price Adjustment. The contract amount will be adjusted when the price of gasoline or diesel fuel changes by more than 25%, as determined by the department. This applies only to fuel stored and used in vehicles and equipment dedicated only to work on the project, excluding burner fuel to dry and heat aggregates. Individual fuel purchases of less than 100 gallons (390 liters) are not eligible for adjustment. Adjustments are calculated from the difference between the base price and the average price during the month the fuel is purchased. The base price for the contract is the average of the high and low price for the five days before the bid opening. The average price for each month of fuel purchase will be the average of the high and low prices on Wednesday of each week in that month in Platt's Oilgram Price Report for Billings, Montana, for unleaded gasoline and low sulfur no. 2 diesel fuel only.

The contract adjustment will be the difference exceeding 25% of the base price.

To obtain a fuel price adjustment, submit a form CB-80 not more than once a month. Attach invoices to the CB-80 form for all quantities shown on it. Ensure the invoices show the vendor, point of delivery, type of fuel, quantity and price.

Show each subcontractors fuel use separately on the same CB-80 form.

Invoices submitted more than 60 days after the fuel purchase will not be considered for adjustment.

Failure to submit invoices when fuel prices decrease is cause for the department to estimate fuel use based on work in progress and deduct the cost from the progress estimates.

Upon request, furnish all fuel purchase, cost, and use records for audit.

Fuel adjustments will not be made on fuel purchased after the contract time has expired.

201.03.5 DISPOSAL. Page 76 9-1-95

Add the following:

Furnish the Project Manager a written statement detailing where non-salvageable treated timber was disposed of.

201.04.2 AREA BASIS Page 77 6-1-00

Rescind subsection 201.04.2 and replace with the following:

201.04.2 Area Basis. Measurement is by the acre (hectare) for the area actually cleared, to the nearest 0.1 acre (0.1 ha) to the limits in the Contract or as staked by the Project Manager. Disposal is not measured for payment.

202.03.3 REMOVAL OF PAVEMENT, SIDEWALKS, CURBS, ETC. Page 80 4-1-00

Rescind Subsection 202.03.3 and replace with the following:

202.03.3 Removal and Disposal of Pavement, Sidewalk, Curbs, Etc. Remove and dispose of all existing bituminous or Portland cement concrete pavement, sidewalks, curbs, etc. to be removed unless otherwise specified. Process, handle and transport these materials to utilize them in embankments on the project, or crush, screen, mix and otherwise process for use as base or traffic gravel as approved or dispose of them as solid waste in conformance with applicable laws, rules, regulations and the Montana Solid Waste Management Act.

Ensure the existing pavement used for embankment or base gravel meets the specifications for the particular item. Process the material to be used as embankment to a maximum 6-inch (150 millimeter) size in its largest dimension. Do not place the removed bituminous pavement in ephemeral drainage's nor within 100 feet (30 m) of standing water and groundwater wells.

Include all costs of this work in the unit price bid for the applicable contract item.

203.03.3 MOISTURE AND DENSITY REQUIREMENTS Page 88 6-1-02

Insert the following after the first paragraph:

If proctors are used for density control, the Contractor may make a written request to the Engineer to compact the soils at a lower moisture content. Identify the soil class in the request.

The Engineer may approve the request provided a Department investigation ensures the lower moisture content is not detrimental to compaction of the soil class.

In Table 203-1 under Zero Air Voids Method, replace MT-299 with MT-229.

203.04.1 EXCAVATION Page 90 4-1-04

Rescind Subsection 203.04.1 and replace with the following:

203.04.1 Excavation. The quantities of unclassified excavation, unclassified borrow excavation, special borrow, unclassified channel excavation, street excavation, subexcavation, and muck excavation for payment is the staked quantities calculated in cubic yards (cubic meters) under Subsection 109.01.

The Department will provide the initial measurement at no charge for the following specific work areas:
(1) In slide areas determined by the Department not to be the fault of the Contractor;
(2) In excavated areas authorized by the Project Manager, outside the staked lines and grades; and
(3) In un-staked areas such as borrow areas, muck excavations, sub-excavations, and un-staked excavations authorized by the Project Manager.

These areas of excavation and borrow are measured in their original position under Subsection 109.01.

Either MDT or the prime contractor may request re-measurement of specific work areas, or the entire project, if there is disagreement over the accuracy of quantities computed from the staked lines and grades. The party requesting the re-measurement will be responsible for all costs associated with the re-measurement. Department staff may perform the re-measurement, in which case, the rate for determining the costs for performing the work will be based upon the original contract amount, and the daily charge established in Table 108-1 of Subsection 108.08. An independent third party acceptable to the District Construction Engineer, and under the direction of a professional land surveyor registered in Montana, may also be used to perform the re-measurement.

Excavation requiring more than one handling before placement may be eligible for additional payment if approved by the Project Manager in advance of the second handling. The second handling of the material will be measured and paid for under the appropriate item of work.

Authorized excavation of rock, shale, muck, or unsuitable material below grade necessary to provide the designed thickness of backfill is measured for payment. If the designated bottom plane of the excavation falls within a layer of rock, the below-grade excavation to the bottom of the layer, not exceeding 150 millimeters below grade, is considered authorized and is measured for payment. Rock excavation exceeding 150 millimeters below grade is not measured for payment. If the nature of the material, the thickness of the layers or strata, and method of operations make it practical to excavate only to the plan depth, any material removed below plan depth is not measured.

Measurements are made for unusable materials excavated and removed.

Useable material temporarily removed and replaced for Contractor convenience is not measured for payment.

Removal and disposal of unusable materials from borrow areas is not measured for payment. Special borrow removed from areas before staking is not measured for payment.

The actual quantities of plan and approved sub-excavation are measured and added to the quantities of unclassified excavation for payment.

Material authorized for removal that cannot be excavated by the methods used for the unclassified excavation is measured and paid for as muck excavation.

Muck excavation reworked under Subsection 203.03.1(D) is measured and paid for as unclassified excavation for the second handling.

Hauling muck excavation to the disposal areas is measured and paid for as haul under Section 206.

When the Contract does not contain a bid item for muck excavation and an area is determined unstable under Subsection 203.01.1(E)(1and 2), the muck excavation quantity is measured and paid for at an agreed price or force account basis under Subsection 109.04. Measurement and payment for muck excavation at the agreed price includes all excavating and hauling, disposing of all stumps, logs, and other debris encountered in the excavation, all pumping and de-watering required, and finishing of the planned disposal areas.

Unclassified excavation allowed for pre-split drill equipment clearance is calculated from the area bounded by the plan slope and lines parallel to plan slope, offset 610 millimeters for each 15.2 meter increment in vertical cut height. The quantity for drill equipment clearance where the cut slope height is less than 15.2 meters is not measured.

Excavation used as select or stockpiled select material is measured by the cubic meter in its original position.

Removed and placed stockpile material is measured using the volume in its original excavated position.

Where it is impractical to measure material by the cross-section method, alternate methods involving three-dimensional measurements may be used.

Channel excavation is measured and paid for as unclassified excavation.

Street excavation is measured and paid for as unclassified excavation unless the contract has street excavation as a bid item.

203.04.3 EMBANKMENT IN PLACE Page 91 3-1-00

Rescind the last sentence in Subsection 203.04.3.

203.04.5 TOPSOIL Page 92 6-1-97

Rescind the last sentence in Subsection 203.04.5 and replace with the following:

Topsoil removed from embankment areas and from borrow areas, excluding contractor-optioned under Section 106, is measured as Topsoil-Salvaging and Placing.

203.05 BASIS OF PAYMENT Page 93 2-1-98

Change the Pay Item "Topsoil" to "Topsoil-Salvaging and Placement."

Add the following Pay Item and Pay Unit:

Pay Item	Pay Unit
Street Excavation	Cubic Yard (cubic meter)

208.03.4 C. EXISTING BRIDGE REMOVAL Page 105 1-1-98

Add the following as a new subsection.

C. Existing Bridge Removal. Furnish the Project Manager 5 copies of a plan and written description detailing how the existing bridge(s) will be removed. Submit the plan at least 45 days before starting removal work. Include in the description what method(s) and equipment will be used to remove the bridge deck, superstructure, piers, footings, and end bents.

Provide the anticipated start date of removal work and estimated time to complete the work.

Include details of erosion control measures used during end bent removal.

Remove all work debris from the waterway within 48 hours of completing the removal work.

Maintain constant progress on all in-stream work until completed.

208.03.5 SEEDING Page 106 6-1-96

Rescind A. Permanent Seeding and re-alphabetize B. Temporary Seeding to: A. Temporary Seeding.

208.04.2 SEEDING Page 106 6-1-96

Rescind Subsection 208.04.2 Seeding, and replace with the following:

208.04.2 Temporary Seeding. Temporary seeding is measured by the acre (hectare), parallel to the groundline, and includes finishing, topsoiling, fertilizing, mulching, and seeding.

208.05 BASIS OF PAYMENT Page 106 6-1-96

Under Basis of Payment, Pay Item, change the item "Seeding" to read "Temporary Seeding."

210.03.6 TEST TRAILERS, TRANSPORT AND SETUP Page 112 4-1-04

Rescind Subsection 210.03.6 and replace with the following:

210.03.6 Test Trailers, Transport and Setup. Transport to the project site or provide electrical power service or both for State-owned test trailers. Supply electrical power 24 hours a day, 7 days a week. Transport, set up, and make the trailer operational at least two days before starting plant mix paving.

Paving operations will be suspended if power level requirements are not maintained.

Obtain a Montana Vehicle Identification (MVI) carrier to transport the 12 foot (3.6 m) by 32 foot (9.8 m) test trailer from a designated location to the project site and return it to a designated location as directed. Transporting includes blocking, leveling, re-blocking, re-leveling and unblocking the trailer. Contact the Engineer for details concerning the transport of the trailer at least 30 days before plant mix operations.

Purchase a minimum $85,000.00 insurance for the trailer and its contents. Provide written proof of insurance to the Engineer before the trailer is moved. Verify that the Department has prepared the trailer and contents for transport.

Repair or replace all contents and trailer damage occurring in transport at Contractor expense. Do not move the trailer without the Engineer's permission.

Furnish and install a continuous 200 ampere, 220 to 230 volt, single phase, 60 hertz power supply to the trailer. Have the source connected by a Montana licensed electrician using a 4 wire conductor.

212.03 CONSTRUCTION REQUIREMENTS Page 117 3-1-00

Rescind the second paragraph and replace with the following:

After the old roadway surfacing is removed , salvage the topsoil from areas to be graded and perform the rough grading. Grade and contour the obliterated roadway to blend with the new roadway and adjacent terrain. Spread the salvaged topsoil and seed the obliterated roadway area.

212.04 METHOD OF MEASUREMENT Page 117 3-1-00

Add the following after the last sentence:

Topsoil is measured under Subsection 203.04.
Seeding is measured under Subsection 208.04

212.05 BASIS OF PAYMENT Page 117 3-1-00

Add the following to the Pay Item and Pay Unit columns:

Pay Item	Pay Unit
Topsoil	Cubic Yard (cubic meter)
Seeding	Acre (hectare)

301.03.1 B. ACCEPTANCE SAMPLING AND TESTING Page 119 5-1-01

Rescind the third paragraph of 301.03.1(B) and replace with the following:

The largest quantity represented by each sample is 2,500 tons (2500 mt) excluding cover material, which is 500 tons (500 mt). Additional samples may be taken and tested.

301.03.1 C. ACCEPTANCE Page 120 2-1-04

Insert the following after the first paragraph:

Develop a proposed job mix target aggregate gradation for each grade of Crushed Base Aggregate to be produced. Establish a single target value for each specified aggregate size within the Job Mix Target Limits shown in Table 701-8. The job mix tolerance will be applied to the approved target values. Submit two copies of a completed job mix target aggregate gradation form to the Project Manager prior to beginning placement of the second lot on the roadway. If multiple sources are used for production, a completed job mix target aggregate gradation form may be submitted for each source prior to beginning placement of the second lot from each respective source. The submitted target aggregate gradation will be applied retroactively to the first lot for assessment. When the quality incentive allowance is waived in accordance with Subsection 105.03.3, the allowed band for each sieve size is equivalent to the job mix target limit with the tolerance applied to the low and high limit.

301.03.5 B.1. PLACING Page 121 6-1-04

Rescind the first sentence and replace with the following:

Transport, place, and spread aggregate surfacing on the roadway.

Rescind the last sentence in 301.03.5(B)(1) and replace with the following:

Spot fill low areas by scarifying roadway, spreading aggregate and compacting to specified density.

301.03.5 C. ROAD MIXING Page 122 3-1-96

Rescind the third paragraph and replace with the following:

Once uniformly mixed, spread in maximum 8-inch (205mm) compacted layers to the required grade and typical cross section. Roller compact the spread layer.

301.03.5 (D) COMPACTION Page 122 6-1-04

Rescind the fifth paragraph and replace with the following:

The department will test the lift(s) of surfacing aggregate in 2000-foot long (610 m) sections based on full typical section width. The in-place dry density of each lift is determined within each section at 10 randomly selected locations. The average of the 10 tests must be a minimum of 98 percent of the target with not more than 2 out of 10 tests being less than 98 percent of the target. The number of tests will be pro-rated for sections with partial lengths and widths. In pro-rated sections, the average of the tests must be a minimum of 98 percent of target density.

301.03.6 SHOULDER GRAVEL Page 123 3-1-00

Add the following new subsection:

301.03.6 Shoulder Gravel. Compact shoulder gravel to provide a firm, hard surface. Finish the slope to provide a smooth surface from the edge of pavement to the catch point.

Furnish gravel meeting the following gradation requirements:

Sieve Size	Percent Passing
3/4" (19.0 mm)	100
No. 4 (4.75 mm)	25-85
No. 200 (0.075 mm)	5-20

Cold milled pavement is not required to meet the above gradation when used as shoulder gravel.

301.03.7 TRAFFIC GRAVEL Page 123 4-1-00

Add the following new subsection:

301.03.7 Traffic Gravel. Furnish traffic gravel meeting Subsection 701.02.4 or 701.02.6. Traffic gravel is not evaluated under Subsection 105.03.2.

Place traffic gravel in the locations and quantities directed by the Project Manager.

301.04.1 B. MEASUREMENT BY THE CUBIC YARD Page 123 3-1-00

Add the following new paragraph:

Traffic Gravel and Shoulder Gravel are measured by the cubic yard (cubic meter).

301.05 BASIS OF PAYMENT Page 124 3-1-00

Add the following Pay Items and Pay Units.

Pay item	Pay Unit
Traffic Gravel	Cubic Yard (cubic meter)
Shoulder Gravel	Cubic Yard (cubic meter)

Insert the following after the Pay Item/Pay Unit columns:

Payment at the unit price bid for traffic gravel includes all costs necessary to furnish and place the gravel.

Traffic gravel that is crushed and stockpiled on the project, but not placed, will be paid at 50% of the unit price bid. Gravel from a commercial source or a source supplying multiple projects and not transported to the project is not measured for payment.

304.03.2 B. ACCEPTANCE SAMPLING AND TESTING Page 128 5-1-01

Rescind the second paragraph and replace with the following:

The approximate quantity represented by each sample is 1500 tons (1500 mt).

Rescind the first sentence in the fourth paragraph and replace with the following:

Five samples will represent approximately 7500 tons (7500 mt) which constitutes a lot whenever production schedules and material continuity permit.

304.03.13 B. THICKNESS Page 130 4-1-96

Rescind the second sentence of Subsection 304.03.13(B) and replace with the following:

Meet an average daily constructed thickness of at least 95% of plan thickness, with no individual measurement less than 90% of plan thickness.

304.04.1 CEMENT-TREATED BASE Page 131 9-1-00

Rescind the first sentence and replace with the following:

Cement-treated base is measured by the cubic yard (cubic meter) of completed volume.

304.05 BASIS OF PAYMENT Page 131 9-1-00

Revise the Pay Unit for Cement-Treated Base as follows:

Pay Item	Pay Unit
Cement-Treated Base	Cubic Yard (cubic meter)

Add the following sentence after the Pay Item and Pay Unit columns:

No payment is made for cement-treated base quantities that exceed plan volume plus 10 percent.

401.03.2 A.13. BURNER FUEL RESTRICTIONS Page 137 4-1-00

Add the following after item 5:

EPA Specification-Used Oil Fuel (EPA-UOF) may be used instead of the approved burner fuels provided the following requirements are met.

Physical Properties

Property	Range
API Gravity	20-28
Viscosity at 122ºF (60ºC) (Saybolt Flurol)	10-20
Pour Point ºF (ºC)	+10 (-12)
Flash Point, min. ºF (ºC)	100 (37.8)
Water by Distillation %	Under 1
Solids by Separation %	Under 1
Ash %	Under 0.4
Sulfur	Average 0.5%
Kinematic Viscosity at 100ºF (37.8ºC) (centistokes)	54-100
Kinematic Viscosity at 122ºF (60ºC) (centistokes)	15-75

Chemical Properties

Element or Compound	Permitted Level
Vanadium	Under 100 ppm (100 mg/L)
Cadmium	Under 2 ppm (2 mg/L)
Chromium	Under 10 ppm (10 mg/L)
Lead	Under 100 ppm (100 mg/L)
Arsenic	Under 5 ppm (5 mg/L)
Total Halogens	Under 1,000 ppm (1,000 mg/L)
PCB's	Under 2 ppm (2 mg/L)

Notify the engineer in writing at least 48 hours before using EPA-UOF. Furnish a copy of the most current tests certified by the supplier and showing compliance with physical and chemical requirements with the notice. Also certify that the plant burner is designed and equipped to properly preheat and burn EPA-UOF. The right to sample and test to verify certified test results is reserved.

Immediately stop using EPA-UOF fuel if burner flame-outs or other evidence of incomplete combustion or mix contamination are evident. Begin using one of the other approved fuels to complete the work. No claim for additional compensation will be considered or allowed.

401.03.3 B.2. AGGREGATE GRADATION Page 142 5-1-01

Rescind the second paragraph and replace with the following:

The approximate quantity represented by each sample is 600 tons (600 mt). Additional samples may be selected and tested at the Project Manager's discretion.

Rescind the first sentence in the third paragraph and replace with the following:

The quantity represented by five samples or approximately 3000 tons (3000 mt) will constitute a lot whenever production schedules and material continuity permit.

401.03.6 SURFACE CONDITIONS, WEATHER LIMITATIONS, AND PAVING DATES Page 144 9-1-03

Rescind Subsection 401.03.6 and replace with the following:

401.03.6 Surface Conditions, Weather Limitations, and Paving Dates. Stop plant mix paving when the surface temperature is less than 35°F (2°C); the surface is wet; the roadbed is unstable or the Project Manager determines adverse weather conditions prevent the proper handling, finishing, or compacting of the mix. Suspend all paving work by November 1st.

Complete all sections of plant mix pavement, to be open to traffic during winter suspension, to the full plan width and thickness, excluding seal coating and open-graded friction course. Complete this work meeting the contract requirements before the November 1st paving cessation date.

The Project Manager will suspend time assessment between November 1st and November 16th when the next scheduled significant work item is paving and all grading, gravel and other operations affecting the safe and convenient use of the roadway by the traveling public are complete.

Submit a written request to the Engineer and obtain written approval to pave after November 1st .

Plant mix surfacing placed after November 1st and before April 15th is at the Contractor's risk and subject to the following conditions.

- The surface temperature to be paved is at least 35°F (2°C), measured by the Project Manager.
- Striping is applied within 24 hours after paving is complete on each day's work.
- All applicable specifications are met.
- Make permanent repairs and restore partially completed pavement to the required profile, section, and condition at Contractor expense before placing any remaining lifts.
- This is not a waiver by the Department of any other contract requirement regarding the work sequence or traffic operation.

If the paving operation causes transverse joints spaced at less than one half mile (805 m), suspend paving work until the next April 15.

No payment is made for the plant mix or asphalt on progress estimates between November 1st and April 15th for partial width or thickness. Promptly repair damage to all partial width or thickness of plant mix surfacing used by traffic during this period for any reason including suspension of work due to adverse weather.

Provide all required interim traffic striping and traffic control on partially completed pavement at Contractor expense.

Failure to promptly make repairs and provide interim striping and traffic control is cause for the Department to perform or have the work performed and deduct the cost from monies due or that may become due the Contractor.

Payment for partial width or thickness pavement in acceptable condition will be made on the estimates following the end of the period on the next April 15th.

These requirements apply when the Project Manager gives written approval to the contractors request that a portion of the planned width or thickness be placed between November 1st and April 15th of the next year.

401.03.10 SPREADING AND FINISHING Page 145 3-1-00

Revise the fourth paragraph of Subsection 401.03.10 as follows:

Establish and maintain horizontal line control for paving. The Engineer will furnish the contractor the necessary survey notes to establish these controls. Maintain the paving control line tolerance within 0.25 foot (75 millimeters) of a true line from the existing reference points using standard surveying practices.

Failure to maintain the paver control line within the specified tolerance is cause for corrective action or pavement removal and replacement, as directed by the Engineer, at contractor expense.

Include the cost of furnishing horizontal line control in the plant mix pavement bid item.

401.03.12 C. COMPACTION CONTROL TESTING. Page 147 2-1-01

Rescind subsection 401.03.12 C. and replace with the following:

Perform all necessary density testing to control compaction.

401.03.12 D. ACCEPTANCE TESTING Page 147 5-1-01

Add as the third sentence to the first paragraph the following:

The core correlation is added to all nuclear density test results.

Rescind the fourth paragraph and replace with the following:

The approximate mix quantity represented by each test is 600 tons (600 mt). Additional tests may be made at the Project Manager's discretion. The quantity represented by five tests or approximately 3,000 tons (3000 mt) of mix will constitute a lot whenever production schedules and material continuity permit. The Project Manager will establish a lot represented by three to seven consecutive random samples when there are short production runs, significant material changes, or other unusual characteristics of the work.

401.03.15 RUMBLE STRIPS Page 148 3-1-00

Add the following new subsection:

401.03.15 Rumble Strips. Cut the rumble strips into the finished plant mix pavement. Use a machine equipped with a rotary type cutting head capable of making the cuts to the dimensions and pattern shown in the Detailed Drawings.

Establish a control line and locate the rumble strips on the shoulder 6-inches from the outside edge of the travel lane. The offset may be adjusted to avoid longitudinal pavement joints. Do not place rumble strips where concrete median barrier rail or other roadside features prevent placement as specified.

Apply a fog seal to the finished rumble strips. Use SS-1 or CSS-1 emulsion for the fog seal. Dilute the emulsion with water at a 1:1 ratio and apply at 0.05 to 0.15 gallons per square yard (0.20 to 0.60 liters per square meter).

Keep traffic off the fog seal until the emulsion has cured to no-track.

Apply the fog seal to the rumble strip for each lane in the direction of travel for that lane.

Produce the rumble strips without tearing and snagging the pavement.

Remove and dispose of the waste material meeting all applicable local, state, and federal regulations.

401.04.6 RUMBLE STRIPS Page 149 3-1-00

Add the following new subsection:

401.04.6 Rumble Strips. Rumble strips are measured by the mile (kilometer) to the nearest tenth of a mile (tenth of a kilometer) along the centerline of the roadway, less all gaps in the rumble strips due to ramp terminals, objects, etc. Each individual line of rumble strips is measured separately.

Fog seal for rumble strips is measured by the undiluted gallon of SS-1. The quantity shown in the contract is an estimate of undiluted SS-1 needed to complete the work and is calculated using an application rate of 0.05 gallons per square yard (0.20 liters per square meter) and an applied width of 24 inches (600 millimeters).

401.05 BASIS OF PAYMENT Page 149 9-1-00

Rescind the third and fourth paragraphs in Subsection 401.05 Basis of Payment and replace with:

Mineral filler and hydrated lime used in the work but not specified in the Contract is paid for at an agreed price under Subsection 109.04.

Add the following Pay Items and Pay Units.

Pay Item	Pay Unit
Rumble Strip	Mile (kilometer)
Emulsified Asphalt SS-1	Gallon (liter)

Add the following after the first sentence under the Pay Item/ Pay Unit columns: The unit price bid for rumble strips will be adjusted as follows:

Line Deviation From the True line	Price Adjustment
0.0 ft. to 0.15 ft. (50 mm) in 500 ft. (152 m)	None
0.15 ft. (50 mm) to 0.25 ft. (75 mm) in 500 ft. (152 m)	50% price reduction
> 0.25 ft (75mm) in 500 ft. (152 m)	Correct as directed

402.03.2 B. ASPHALT SAMPLING (QUALITY ASSURANCE SAMPLING) Page 151 5-1-01

Rescind the fourth paragraph and replace with the following:

The Project Manager will randomly designate the time of sampling based on the tons (metric tons) of completed mix produced. The approximate quantity of mix represented by each sample will be 500 tons (500 mt). The Project Manager may require additional samples and testing.

Rescind the first sentence in the fifth paragraph and replace with the following:

Six samples will represent approximately 3000 tons (3000 mt) of mix and constitute a lot whenever production schedules or material continuity permit.

Rescind the second sentence in the fifth paragraph and replace with the following:

The Project Manager may establish a lot consisting of the quantity represented by any number of consecutive random samples, from three to seven inclusive, when necessary to represent short production runs, significant material changes, or other unusual characteristics of the work.

402.03.6 TABLE 402-1 Page 153 9-1-03

Add the following temperatures to the Emulsified Asphalts Table seen below:

TABLE 402-1
RECOMMENDED APPLICATION TEMPERATURES
FOR ASPHALT - DEGREES F

LIQUID ASPHALTS - RC, MC and SC

Grade	Loading Temp. Max.*		Spraying Temp.	Mixing Temp. of Aggregates for MC & SC Liquid Asphalts			
				Min.		Max.	
	˚F	˚C		˚F	˚C	˚F	˚C
70	195	91	**As required to Achieve viscosity of 50-200 centistokes (25-100 Sec. Saybolt Furol)	90	32	155	68
250	245	118		125	52	200	93
800	275	135		160	71	225	107
3000	310	154		200	93	260	127

*Line Temperatures
**See Temperature - Viscosity Charts (MT-308)

EMULSIFIED ASPHALTS

Grade	Mixing Temperature				Spraying Temperature			
	Min.		Max.		Min.		Max.	
	˚F	˚C	˚F	˚C	˚F	˚C	˚F	˚C
Slow and Medium Setting	50	10	130	54	50	10	130	54
Rapid Setting	125	52	185	85	120	49	160	71

ASPHALT CEMENTS

Grade	Mixing Temperature	Spraying Temperature
All Penetration Grades	Established by Project Manager	350˚F Max. (177˚C)

402.03.7 ALTERNATE TYPE OR GRADE OF ASPHALT Page 153 2-1-99

Rescind the last sentence in Subsection 402.03.7.

402.03.8 PERFORMANCE GRADED ASPHALT BINDER Page 154 6-1-00

Add the following new subsection:

402.03.8 PERFORMANCE GRADED ASPHALT BINDER (PGAB). Furnish Performance graded Asphalt Binder (PGAB) meeting Table 702-9 requirements for the binder specified in the contract. Ensure PG 64-34 binder, after its aged in the Rolling Thin Film Oven, and tested under AASHTO T-51 meets the following:
Pull Rate: 5 cm/minute. Sample temperature: 25ºC Ductility: 40 cm, min.

Notify the Project Manager in writing before making changes to the PGAB components.

A. Test Results. Provide current test results for all PGAB requirements for material furnished. Furnish the PGAB test data with the first delivery and for each 2000 tons (1800 mt) delivered to the project.

B. PGAB Shipping, Handling, and Storage. Ship, handle, and store the PGAB following the supplier's requirements. Furnish the Project Manager a copy of the requirements before delivering the PGAB to the project. Ensure that the supplier's requirements are consistent with the material manufacturer's. PGAB exhibiting separation, crusting, or foaming during delivery or in storage tanks will be rejected.

C. Sampling. Sample the PGAB meeting subsection 402.03.2 (B). A sample is two one pint (two 500 ml) containers of PGAB.

D. Acceptance. The Department will grade each lot's sample using the PGAB grading system, and Table 702-9, with duplicate containers retained for testing in case of dispute. PGAB is accepted under subsection 105.03.2 using an 'F' factor of 4. The "P" value is determined for the high temperature components of the resulting grade (ie. 64, 58, etc.) using the formula P = (TL+aR-Xn) x F. The "P" value is determined for the low temperature component of the resulting grade (ie. -34, -28, etc.) using the formula P = (Xn+aR-Tu) x F. Positive 'P' value is added to determine the lot's total price reduction.

If the calculation results in a price reduction, the Contractor may make a written request for an independent laboratory to grade the duplicates for the lot in question. Ensure the department receives the written request within 30 calendar days of the notification of price reduction. The Contractor and the Department will agree upon the choice of independent laboratory before release of the duplicate samples for testing. The independent laboratory results are binding on both parties for acceptance and payment of the material in question. Pay the cost of the duplicate testing, on a per lot basis, if the price reduction is confirmed or increased. The Department will pay the cost of the duplicate testing, on a per lot basis, if the price reduction is reduced.

The ductility requirement for PG 64-34 has no tolerance. Immediately stop paving if the binder fails the ductility requirement and re-start paving once binder meeting the specifications is furnished.

404.03.3 A.2. AGGREGATE GRADATION Page 156 5-1-01

Rescind the first paragraph and replace with the following:

Gradation test samples are randomly selected by the Project Manager. Each sample will represent approximately 400 tons (400 mt). The Project Manager may require additional test samples.

Rescind the first sentence in the second paragraph and replace with the following:

Five samples will represent approximately 2,000 tons (2000 mt) and constitutes a lot whenever production schedules and material continuity permit.

409.02.1 BITUMINOUS MATERIAL Page 167 3-1-00

Rescind Subsection 409.02.1 and replace with the following:

409.02.1 Bituminous Material. Furnish material meeting Table 702-8 as specified in the contract.

409.03.4 SEASONAL AND WEATHER LIMITATIONS Page 168 8-1-01

Revise items 1 and 2 of Subsection 409.03.4 to read as follows:

1. Perform seal coat operations between May 1 and August 31.
2. Do not perform seal coat work during the 48-hour period immediately preceding a holiday or a holiday weekend excluding pilot car operations.

409.03.13 OPENING TO TRAFFIC Page 170 8-1-01

Rescind Subsection 409.03.13 and replace with the following:

409.03.13 Opening to Traffic. Open the roadway to traffic after the roadway has been swept free of loose chips.

Broom on the day following the seal and cover application and before discontinuing the use of the pilot car. Broom in the early morning to minimize dust and to reduce loosening or displacing of embedded aggregate. Provide additional rolling if required.

If the seal coat fails to cure properly, or if inclement weather interrupts the 48-hour cure period, continue traffic control as directed.

Correct surface irregularities affecting the ride quality at Contractor expense. Cover areas showing excess asphalt with additional aggregate or blotter material at Contractor expense.

411.03.2 GENERAL. Page 177 2-1-01

Rescind the fourth paragraph and replace with the following:

Replace all other areas designated for milling with new plant mix surfacing within 24 hours after the milling is performed.

501.03.8 A.2. STRAIGHTEDGE FINISHING Page 184 1-1-98

Rescind sentences 1 through 5 of Subsection 501.03.8(A)(2) and replace with the following:

2. Finishing. Finish the concrete surface to meet Subsection 501.03.14(A) or (B).

501.03.8 B.5. STRAIGHTEDGE FINISHING Page 186 1-1-98

Rescind 501.03.8(B)(5) and replace with the following:

5. Finishing. Finish the concrete surface to meet Subsection 501.03.14(A) or (B).

501.03.8 C & D FINAL SURFACE FINISH & TEXTURING Page 186 5-1-04

Replace part C. and add part D. in subsection 501.03.8 with the following:

C. Final Surface Finish. Hand-float the surface only as needed to produce a uniform surface and sharp corners; do not use excess mortar to build up slab edges or round the slab corners. Before the concrete's initial set, work the pavement edges along each side of transverse isolation joints, transverse construction joints, and fixed forms to produce a ¼ inch (6 mm) continuous radius and a smooth, dense mortar finish. Check the surface of the fresh concrete with a long-handled straightedge that is 10 feet (3 m) or longer. Remove high areas indicated by the straightedge.

D. Texturing. After surface finishing, texture all concrete surfaces within the travel lanes. Use either hand operated or mechanical tools to produce a uniform texture that conforms to the dimensions shown on the plans and the following:

For artificial carpet and burlap drag, ensure the carpet or burlap will be sufficiently long and wide to cover the entire pavement width and to produce a uniform texture. Clean drag periodically to remove encrusted mortar or replace with new burlap or carpet.

Meet an average surface texture of 0.040 inch (1 mm) to 0.060 inch (1.5 mm), as measured by MT-113 (sand patch test).

If repair of high spots or low spots results in surface texture loss, repair the affected area to the specified texture at the Contractor's expense.

1. Design speed greater than 50 mph (80 km/h).
   Produce the final surface finish with transverse tining, followed by longitudinal artificial carpet or burlap drag.

   Space transverse tines randomly as follows: minimum spacing 1/2 inch (10 mm), maximum spacing 1-1/2 inch (40 mm), with no more than 50% of the tines apart by more than 1 inch (25mm). Use tines that are 1/8 inch (3 mm) wide, with a tolerance of ±0.02 inch (±0.5 mm) and apply them to a depth of 1/8-1/4 inch (3-6 mm) (provided minimum dislodging of the aggregate particles result).

2. Design Speed less than 50 mph (80 km/h).
   Produce the final surface finish by broom texturing, followed by a longitudinal artificial carpet or burlap drag.

   Produce a uniform texture with corrugations 1/16 inch (1.5 mm) deep.

501.03.14 SURFACE TEST Page 188 1-1-98

Rescind the first sentence and replace with the following:

501.03.14 Surface Test. Test pavement surfaces exceeding 300 feet (91.5 m) long under (A) below. Test surfaces 300 feet (91.5 m) and shorter under (B) below.

501.03.14 A. PROFILOGRAPH Page 188 4-1-96

Rescind "All sections must have a maximum average profile index of 15 inches (380mm) per mile to be accepted.", and replace with the following:

Acceptable sections are those having an average profile index not exceeding 15 inches (380mm) per mile (1.61km).

501.03.16 OPENING TO TRAFFIC Page 191 8-1-03

Rescind Subsection 501.03.16 and replace with the following:

501.03.16 Opening To Traffic. Do not permit traffic or Contractor equipment, excluding joint sawing and sealing equipment, on the concrete until flex beam test results indicate the concrete has developed a minimum 350 psi (2415 kPa) modulus of rupture.

Prepare the concrete flex beams meeting AASHTO T-23 and test for modulus of rupture using AASHTO T-97.

One test set consists of three beams. Take the concrete for the test beams from different concrete batches for each 2500 square yards (2100 square meters) of concrete pavement and make at least two sets per day. Test the beam sets for modulus of rupture. Cure the test beams under the same environmental conditions as the pavement they represent. The pavement, represented by the beams, may be opened to traffic when the average modulus of rupture of the set exceeds 350 psi (2415kPa) and no individual beam's modulus of rupture is less than 300 psi (2070 kPa).

The Contractor may select the time for testing the beams. Test the flex beams on or near the project using Contractor furnished equipment and with a Department inspector witnessing the tests.

Include all costs to make, cure and test the flex beams in the unit bid price for Portland Cement Concrete Pavement.

Opening to traffic does not constitute a final acceptance of the pavement. The pavement will be accepted upon confirmation of the 28-day flexural strength. Repair all concrete damaged prior to the final acceptance at contractor expense.

551.02.2 AIR ENTRAINING AGENTS Page 197 6-1-03

Replace Subsection 551.02.2 Air-Entraining Agents with the following:

551.02.2 Air-Entraining Agents. Include an air-entraining agent in the mix design. Ensure that the air-entraining agent meets AASHTO M 154 requirements.

551.02.3 ADMIXTURES Page 198 6-1-03

Replace Subsection 551.02.3 Admixtures with the following:

551.02.3 Admixtures. Ensure that all chemical admixtures included in the mix design meet AASHTO M 194 requirements. Insure that the total contribution of chloride ions from all admixtures and air-entraining agents does not exceed 50 parts per million chloride ions (Cl-) by weight of cementitious material.

551.02.9 BLENDED CEMENTS Page 199 6-1-03

Add subsection 551.02.9 as follows:

551.02.9 Blended Cements. When specified in the mix design, furnish Type IP, Type I(PM), or Type I(SM) cement meeting AASHTO M-240 requirements.

551.02.10 FLY ASH Page 199 6-1-03

Add subsection 551.02.10 as follows:

551.02.10 Fly Ash. When included in the mix design, furnish fly ash meeting AASHTO M-295 Mineral Admixture Class C or Class F , the chemical requirements of Table 1, and the physical requirements of Table 3 in M-295.

551.02.11 MICROSILICA Page 199 6-1-03

Add new subsection 551.02.11, as follows:

551.02.11 Microsilica. When included in the mix design, furnish microsilica meeting AASHTO M-307.

551.02.12 METAKAOLIN Page 199 6-1-03

Add new subsection 551.02.12, as follows:

551.02.12 Metakaolin. When included in the mix design, furnish metakaolin meeting AASHTO M-295 Mineral Admixture Class N , the chemical requirements of Table 1 and the physical requirements of Table 3 in M-295.

551.02.13 GROUND GRANULATED BLAST FURNACE SLAG Page 199 6-1-03

Add new subsection 551.02.13 as follows:

551.02.13 Ground Granulated Blast Furnace Slag. When included in the mix design, furnish ground granulated blast furnace slag meeting AASHTO M-302.

551.03.1 B. CLASSES “AD” AND “DD” CONCRETE Page 200 4-1-96

Rescind subsection 551.03.1(B) and replace with the following:

B. Classes "AD" and "DD" Concrete. Classes "AD" and "DD" concrete are used for all structural concrete.

Class "AD" concrete may be substituted for Class "DD" concrete with the Project Manager's written approval. Bid all structural concrete as Class "DD". If a substitution is made, changing back to Class "DD" must be requested in writing and receive the Project Manager's written approval.

551.03.1 C. CLASSIFICATION Page 200 6-1-03

Replace Subsection 551.03.1 C Class “BD Modified” Concrete with the following:

C. Class “SD” (Special Deck) Concrete. Class "SD" (Special Deck) concrete is used for all superstructure concrete including deck slabs and barriers.

551.03.2 A. DESIGN Page 200 6-1-03

Rescind 551.03.2 (A), Design and replace with the following:

A. Design. Design the concrete mix as follows:

1. Upon written request, the Department will furnish a preliminary laboratory mix design for each class of concrete. Use this mix design as a starting point for designing the final mix.

2. Design the concrete mix to meet Table 551-1 requirements. State the design proportions in terms of aggregates in a saturated, surface dry condition. Submit the proposed aggregate source and proportion computations. Submit a final mix design to the Engineer for approval. Submit mix designs based on aggregates used on highway projects within one year for review and approval at least 14 days before use. Submit the mix designs based on aggregates from new sources for review at least 33 calendar days before use.

3. Do not change the material sources without the Engineer's approval.

4. The following cementitious materials may be used as partial replacement for Portland cement in the mix design.
   a. Fly ash may be included in the mix design for up to 20 percent by weight of the total cementitious material. Portland Cement meeting AASHTO M 85, Table 1, may be used in place of moderate heat of hydration cement where fly ash is substituted.
   b. Microsilica may be included in the mix design for up to 5 percent by weight of the total cementitious material when a minimum of 15 percent fly ash is also included in the mix design or when the mix design uses Type IP blended cement.
   c. Metakaolin may be included in the mix design for up to 20 percent by weight of the total cementitious material.
   d. Ground Granulated Blast Furnace Slag may be included in the mix design for up to 20 percent by weight of the total cementitious material.

   Calculate the water-cement ratio as the total weight of water divided by the total weight of cementitious material.

5. Except when Type V cement is specified, blended cements meeting the requirements of Section 551.02 may be used in the mix design.

6. The mix design may include provisions that address special conditions of the project that would otherwise not be allowed. The following provisions may be included in the mix design.
   a. Delayed Initial Set – The mix may be designed for delayed set time to allow for long haul or other project conditions. When delayed set is included in the mix design, the time requirements for placing the concrete in final position contained in Subsection 551.03.4 A. may be replaced by time to final placement requirements included in the mix design. Include in the mix design information on the delayed set provisions of the design and specific time to final placement requirements.
   b. Slow Strength Gain – The mix design may include cementitous materials or other admixtures that result in slow strength gain. When a slow strength gain is included in the mix, include in the mix design a recommendation for the age in days at which the strength will be obtained. Ensure that the recommended age is no less then 28 days and no more then 56 days. Support this recommendation with test results. Upon acceptance, the recommended age will be used in all provisions that refer to 28-day strength.

551.03.2 D. CLASS “BD MODIFIED” CONCRETE Page 202 6-1-03

Rescind 551.03.2 (D), Class “BD Modified” Concrete and replace with the following:

D. Class "SD" Concrete. Produce Class "SD" concrete meeting Table 551-1 requirements.

Furnish coarse aggregate meeting the gradation requirements for No. 2 coarse aggregate in Table 701-4 in Subsection 701.01.2, with five percent maximum passing the No. 8 (2.36 mm) sieve.

551.03.2 E. CLASS "NS" CONCRETE Page 203 7-1-96

Rescind the Material and Weight per cubic yard table and replace with the following:

Material	Weight per cu. yd. (kg/m³)
Cement- 0.45 sack	42 lbs (25 kg/m³)
Water- 39 gallons (147.6 L)	325 lbs (193 kg/m³)
Coarse Aggregate	1700 lbs (1009 kg/m³)
Fine Aggregate	1845 lbs (1095 kg/m³)

551.03.2 E. TABLE 551-1 CONCRETE PROPORTIONING Page 203 6-1-03

Rescind Table 551-1 and replace with the following:

TABLE 551-1
CONCRETE PROPORTIONING TABLE

Class	Size of Coarse Aggregate, Square Mesh, Inches (mm)	Indicated Compres-sive Strength 7-Day, PSI (MPa)	Minimum Required Compres-sive Strength 28-Day,PSI (MPa)	Maximum Water / Cement Ratio (W/C)	Target Value for Slump, Inches (mm) Note 4	Toler-ance Inches (mm)	Required Air Content, Percent
A	1-1/2 (37.5)	2000 (14)	3000 (21)	0.53	2-1/2 (60)	±3/4 (20)	4-6
D	3/4 (19)	2000 (14)	3000 (21)	0.53	2-1/2 (60)	±3/4 (20)	5-7
AD	1-1/2 (37.5)	2000 (14)	3000[3] (21)	0.53	2-1/2 (60)	±3/4 (20)	4-6
DD	3/4 (19)	2000 (14)	3000[3] (21)	0.53	2-1/2 (60)	±3/4 (20)	5-7
AS	1-1/2 (37.5)	1600 (11)	2400 (17)	0.53	6 (150)	±2 (50)	—
DS	3/4 (19)	1600 (11)	2400 (17)	0.53	6 (150)	±2 (50)	—
AP[1]	1-1/2 (37.5)	2000 (14)	Note 3	0.53	1-1/2 (40)	±3/4 (20)	4-6
DP[1]	3/4 (19)	2000 (14)	Note 3	0.53	1-1/2 (40)	±3/4 (20)	5-7
Pre[2]	3/4 (19)	—	5000 (34)	—	—	—	—
F	1-1/2 (37.5)	—	—	0.53	—	—	—
AC	1-1/2 (37.5)	—	—	0.53	1-1/2 (40)	±3/4 (20)	—
DC	3/4 (19)	—	—	0.53	1-1/2 (40)	±3/4 (20)	—
SD	3/4 (19)	—	Note 3	0.40	2-1/4 (60)	±3/4 (20)	5-7

NOTES:
[1] For concrete pavement, the 28-day flexural strength requirement is 500 psi (3.5 MPa) minimum, determined by AASHTO T9 (ASTM C 78).
[2] For prestressed beams, the minimum compressive strength at transfer of pre-stress is 4000 psi (28 MPa). The strength shown at transfer of pre-stress and the 28-day requirement are for standard beams and will vary with beam length and design. Check plans and specifications for each project.
[3] The minimum required compressive strength at 28 days listed in the table does not apply to Classes "AD" and "DD" concrete used in bridges and structures. The compressive strengths for acceptance for Classes "AD" and "DD" concrete used in bridges and for Classes "AP", "DP", and "SD" concrete is that specified in Subsection 551.03.7(C)(1).
[4] The target value for slump may be reduced as necessary for concrete placed using slip-form methods. When included in the mix design, mid range or high range water reducers may be used to increase slump to facilitate placement.

551.03.7 A. COMPRESSIVE STRENGTH TESTING Page 210 6-1-03

Rescind 551.03.7(A), Compressive Strength Testing and replace with the following:

A. Compressive Strength Testing.

1. General. A compressive strength sample consists of three test cylinders made at the same time from the same batch of concrete.
   The Contractor may make additional cylinders to determine strength gain and to maintain job control.
   Standard compressive strength tests will be made at seven and 28 days, except as specified below for concrete used in prestressed members and for Class "SD" concrete.
   The compressive strength results from one or a combination of the cylinders tested will determine if the concrete meets the required compressive strength in Table 551-1.
   Samples for making the cylinder will be taken following MT-105. Test cylinders will be cast and cured following MT-101 and tested meeting AASHTO T 22.
2. Prestressed Concrete Members. Standard compressive strength tests for Class "Pre" concrete will be made at 28 days. The average strengths of the three 28-day cylinders will determine acceptance under Subsection 551.03.7(C)(2).
   The Contractor may make additional cylinders to determine strength gain and to maintain job control.
3. Class "SD" Concrete. Standard compressive tests for Class "SD" concrete will be made at seven and 28 days. The average strengths of two 28-day cylinders will determine acceptance under Subsection 551.03.7(C)(1).

551.03.7 C.1. ACCEPTANCE OF CONCRETE Page 211 6-1-03

Rescind subsection 551.03.7 C. 1., Table 551-3 and Table 551-4 and replace with the following:

1. Classes "AD", "DD", "SD", "AP", and "DP" Concrete. These classes of concrete placed in bridges and in concrete pavement are evaluated for acceptance on a lot-by-lot basis.

   The concrete quantity placed in a single day for each class of concrete is divided into the number of equal quantity lots shown in Table 551-3.

TABLE 551-3
CONCRETE LOT QUANTITIES

Classes "AD", "DD", and "SD"	Classes "AP" and "DP"	No. of Lots
Less Then 200 Cu Yd (153 m^3)	Less Then 1000 Cu Yd (765 m^3)	1
200-399 Cu Yd (153-305 m^3)	1000-1999 Cu Yd (765-1529 m^3)	2
400-599 Cu Yd (306-458 m^3)	2000-2999 Cu Yd (1530-2294 m^3)	3
600-799 Cu Yd (459-611 m^3)	3000-3999 Cu Yd (2295-3059 m^3)	4
800-999 Cu Yd (612-764 m^3)	4000-4999 Cu Yd (3060-3824 m^3)	5

Two sets of standard compressive test cylinders (6 x 12-inch or 4 x 8-inch) will be made for each lot. Each set will be made from a sample taken from a single batch or load selected at random from all loads or batches in the lot. For concrete lots less then 30 Cu Yd (23 m^3), the Engineer may elect to make only one set of standard compressive test cylinders to represent the lot.

Each set will consist of one cylinder for Classes "AD", "DD", "AP", and "DP" concrete and two cylinders for Class "SD" concrete.

Samples to make the cylinders will be taken following MT-105. Cylinders will be cast and cured using MT-101 and tested under AASHTO T 22.

Each set of cylinders is tested for compressive strength at 28 days. The test results for two cylinder sets will be the average of the strengths of the individual cylinders.

The strengths of other cylinders made from the sample and tested at earlier ages are not used for acceptance.

The lot acceptance strength is the average of the test results for the lot.

Each lot is accepted or rejected based on the lot acceptance test strength. The pay factor for each lot accepted is determined from the following table.

Table 551-4
PAY FACTORS

LOT ACCEPTANCE STRENGTH – PSI (1 psi=6.9 kPa)

Class	1.0	0.95	0.85	0.70
AP, DP, AD, DD	3000 or >	2850-2999	2700-2849	< 2700
SD	4500 or >	4300-4499	4100-4299	< 4100

The Contractor may request acceptance of a lot at the 0.95 pay factor in lieu of approved corrective work or removal and replacement.

Acceptance at the 0.85 and 0.7 pay factor instead of approved corrective work or removal and replacement will be on the Engineer's determination of the effects the defective lot will have on structural integrity and durability specified in Subsection 105.03.

The concrete quantity in each accepted lot is paid at the contract unit price multiplied by the appropriate pay factor in Table 551-4.

The lot quantity for pay factors less than 1.0 is computed from:

a. Plan neat line dimensions of the portions of the bridge or bridges where the lot was placed; or
b. The plan area in square yards (square meters) of the section of pavement in which the lot was placed.

551.03.7 C.4. SMALL CONCRETE QUANTITIES Page 213 6-1-03

Rescind 551.03.7 C. 4. Small Concrete Quantities and replace with the following:

4. Small Concrete Quantities. The Project Manager may accept seven cubic yards (5.4 cubic meters) or less of 3,000 psi (20.7 MPa) strength concrete without a formal mix design. Submit a batch proportion sheet to the Project Manager for approval before use. Class "SD" concrete is excluded from this exception. Furnish concrete under this exception meeting the slump requirements in Table 551-1.

552.03.1 C. GENERAL Page 215 6-1-03

Rescind 552.03.1 C. and replace with the following:

C. Class “SD” for decks, curbs, sidewalks, and barriers.

552.03.5A GENERAL Page 216 6-1-97

Add the following as the third sentence to Item 6.

Use plastic or rubber tipped vibrator heads when placing concrete near epoxy coated reinforcing steel.

552.03.5A GENERAL Page 216 9-1-03

Add the following as the last paragraph to 552.03.5A:

Place deck slab concrete a minimum of 7 calendar days after placing diaphragm concrete or when standard compressive strength test results verify that the diaphragm concrete has attained a compressive strength of 9.5 Mpa (1,360 psi).

552.03.11 REMOVAL OF FORMS AND FALSEWORK Page 222 4-1-96

Rescind paragraphs one through five of Subsection 552.03.11 and Table 552-1 and replace with the following:

552.03.11 Removal of Forms and Falsework.

Do not release, loosen, or remove forms or falsework without the Project Manager's approval. This approval does not relieve the Contractor of responsibility for the safety of work.

Approval to remove forms will not be given before the minimum times in Table 552-1.

The times in Table 552-1 are exclusive of days when the ambient temperature falls below 40ºF (5ºC); as the 7 day curing period is based on a minimum curing temperature of 60ºF (15ºC).

The exact time lapse before forms may be removed will be determined by the Project Manager based on the site curing conditions of the concrete.

The Contractor may request, in writing, to use high early strength cement or a richer mix to reach concrete compressive strengths earlier and these times may be reduced as directed.

Table 552-1
Minimum Cure Times Before Form Removal

ITEM	MINIMUM TIME
Walls, piers, and abutments (not yet supporting loads)	24 hours
Sides of columns, beams, and other comparable parts	24 hours
Railings	12 hours
Sidewalks on bridges	7 days
Slabs when supported on steel or wood stringers and precast concrete girders with unsupported span lengths less than 10 feet (3048 mm)	7 days
Centering under crossbeams, girders, T-beams, caps, struts, box girders, top slabs on concrete box culverts, and slabs	14 days or 80% percent of the specified 28-day strength.

552.03.14 PLACING ANCHOR BOLTS. Page 229 12-1-95

Add the following paragraph at the end of Subsection 552.03.14:

Install the anchor bolt nuts as shown on the plans. Tighten the upper nut against the lower nut to ensure neither nut can be turned by hand.

552.05 C. BASIS OF PAYMENT Page 231 6-1-03

Rescind the first paragraph of 552.05 C. and replace with the following:

C. Classes “AD, “DD”, and “SD” concrete placed in bridges are subject to a payment reduction based on lot payment factors under Subsection 551.03.7(C)(1).

553.03.10 CURING Page 241 8-1-03

Rescind the twelfth paragraph of Subsection 553.03.10 and replace with the following:

Do not expose the members to below-freezing temperatures within six days of casting. In place of the six day requirement, the cure time may be based on the concrete strength. The concrete strength is determined by the average strengths of three standard 6 x 12-inch (152 X 305 mm) or 4 x 8-inch (102 x 203 mm) cylinders cast from different batches of concrete used in each round of beam castings. Expose these cylinders to the same cure and temperature conditions as the prestressed members. Immediately test the cylinders according to AASHTO T22 without further curing, once they are removed from the cure area.

553.03.15 WORKMANSHIP AND TOLERANCES. Page 244 2-1-01

Rescind the first sentence of the second paragraph and replace with the following:

The tolerances from the plan and theoretical dimensions listed in Table 553-1 are the maximum acceptable cumulative deviations. The Engineer will verify that the girders are within the allowable tolerances when the girders alignment is not influenced by temporary temperature differences between the girders surfaces.

Table 553-1 TOLERANCES FOR PRE-STRESSED CONCRETE MEMBERS. Page 245 2-1-01

Rescind the verbiage in the eighth row under the “ ELEMENT” column and replace with the following:

Horizontal alignment (deviation from a straight line parallel to centerline of the member)

554.03.6 CURING & TESTING CONCRETE Page 248 8-1-03

Rescind the eighth paragraph in Subsection 554.03.6 and replace with the following:

Cure until the compressive strength of the standard 6 X 12- inch (152 X 305 mm) or 4 x 8-inch (102 x 203 mm) cylinders, cured under the same conditions as the concrete represented, reaches the required strength for the class of concrete or the specified strength.

554.04.2 PRECAST CONCRETE BARRIER RAIL Page 249 1-1-04

Rescind Subsection 554.04.2 and replace with the following:

Precast concrete barrier rail is measured under Subsection 606.04.

555.03.1 PROTECTION OF MATERIAL Page 251 6-1-97

Add the following paragraphs:

Cover all reinforcing steel from weather exposure using an opaque moisture resistant covering that permits air circulation. Do not permit epoxy coated reinforcing steel to be exposed to sunlight in excess of 60 days.

555.03.3 PLACING AND FASTENING Page 251 5-1-98

Add the following after the first sentence:

Do not weld reinforcing steel to hold in place or fasten without submitting a written request to, and receiving the Engineer's approval. Include in the request ANSI/AWS procedures to be used.

555.04 TABLE 555-3 Page 254 9-1-98

Rescind Table 555-3 and replace with the following:

Table 555-3
Weights of Standard Sizes of Reinforcing Bars

Bar Size	(Metric)	Bar Diameter		Weight	Mass
No. 3	(10)	0.375 in.	9.5 mm	0.376 lb/ft	0.560 kg/m
No. 4	(13)	0.500 in.	12.7 mm	0.668 lb/ft	0.994 kg/m
No. 5	(16)	0.625 in.	15.9 mm	1.043 lb/ft	1.552 kg/m
No. 6	(19)	0.750 in.	19.1 mm	1.502 lb/ft	2.235 kg/m
No. 7	(22)	0.875 in.	22.2 mm	2.044 lb/ft	3.042 kg/m
No. 8	(25)	1.00 in.	25.4 mm	2.670 lb/ft	3.973 kg/m
No. 9	(29)	1.128 in.	28.7 mm	3.400 lb/ft	5.060 kg/m
No. 10	(32)	1.270 in.	32.3 mm	4.303 lb/ft	6.404 kg/m
No. 11	(36)	1.410 in.	35.8 mm	5.313 lb/ft	7.907 kg/m
No. 14	(43)	1.693 in.	43.0 mm	7.650 lb/ft	11.38 kg/m
No. 18	(57)	2.257 in.	57.3 mm	13.600 lb/ft	20.24 kg/m

555.05 BASIS OF PAYMENT Page 255 6-1-00

Rescind the percentages shown items one through three and replace with the following:

1. 85% when the material is accepted and placed and tied.
2. 100% when covered with concrete.

556.01 DESCRIPTION Page 257 3-1-00

Rescind the Material and Weight per foot (meter) column and replace with the following:

Material	Weight per cubic foot (cubic meter)
Malleable Iron	470 lbs (7530 kg/m³)
Wrought Iron	487 lbs (7800 kg/m³)
Steel, rolled, cast copper bearing, silicon nickel, and stainless	490 lbs (7850 kg/m³)

Rescind the last paragraph and replace with the following:

Weld metal weight is not computed.

556.03.1 PRE-QUALIFICATION Page 258 5-1-04

Rescind Subsection 556.03.1 and replace with the following:

556.03.1 Pre-qualification. Use metal fabricators that are pre-qualified under the AISC Quality Certification Program. Registration and certification of the plant or shop under the AISC Quality Certification Program (Categories seen below) and submission of a valid certificate to the Bridge Engineer, MDT, PO Box 201001, Helena, MT 59620-1001 is required. Furnish an annual endorsed copy for continued qualification.

AISC Quality Certification Categories

- Conventional Steel Building Structures (SBD): The certification is typically specified for small public service and institutional buildings (schools, etc.), shopping centers, light manufacturing plants, miscellaneous and ornamental iron work, warehouses, low rise beam/column/light truss structures.

- Simple Steel Bridge Structures (SBR): The certification is typically specified for unspliced rolled beam bridges.
- Complex Steel Building Structures (CBD): The certification is typically specified for high-rise buildings, large public service and institutional buildings, heavy manufacturing plants, powerhouses, and petro/chemical processing facilities.
- Major Steel Bridges (CBR): The certification is typically specified for large span bridges. Main members are typically fabricated girders that must be spliced with a welded or bolted connection.
- Metal Building Systems (MB): Pre-engineered metal building systems including coldformed members and panels.

Fabricators certified for Complex Steel Building Structures are automatically certified for Conventional Steel Building structures and those certified for Major Steel Bridges are automatically certified for Simple Steel Bridge Structures.

- Sophisticated Paint System Endorsements (P1, P2, P3): There are currently three Paint Endorsements available:
  P1 – Sophisticated Paint Endorsement – Enclosed
  P2 – Sophisticated Paint Endorsement – Covered
  P3 – Sophisticated Paint Endorsement – Exposed
- Fracture Critical Members Endorsement (F): Familiarity with procedures required to produce fracture critical members in accordance with a fracture control plan as defined by AASHTO or AREA.

Use only fabricators having a Category CBR certification to fabricate the following:

1. Fracture critical members and attachments. Fabricators must have the Fracture Critical endorsement (F).
2. Main members, except for rolled beams;
3. Welded floor beams;
4. Cross frames and diaphragms for curved bridges.

Use fabricators having a Category SBR, SBD, CBD, or CBR certification to fabricate the following:

1. Modular Expansion Joints;
2. Welded bearings;
3. Steel grid flooring;
4. Overhead, truss, and cantilever sign structures;
5. Lighting poles and anchor bases.

556.03.9 D. TABLE 556-3 SPACING AND EDGE DISTANCE OF BOLTS Page 264 5-1-98

Rescind Table 556-3 and replace with the following:

TABLE 556-3
SPACING AND EDGE DISTANCE OF BOLTS

BOLT LOCATION	BOLT SIZE			
	1" M 24 mm	7/8" M 22 mm	¾" M 20 mm	5/8" M 16 mm
	Spacing or Distance – Inches			
Minimum Spacing of Bolts Center-to-Center	3 1/2" 90 mm	3" 75 mm	2 1/2" 65 mm	2 1/4" 55 mm
Minimum Distance From Center of Bolt to Nearest Sheared Edge and to Edges of Beams and Channels	1 3/4" 42 mm	1 1/2" 38 mm	1 1/4" 34 mm	1 1/8" 28 mm
Minimum Distance From Center of Bolt to Nearest Rolled, Planned Edge, or Gas Cut	1 1/2" 30 mm	1 1/4" 28 mm	1 1/8" 26 mm	1" 22 mm
Maximum Distance From Center of Bolt to Nearest Edge	Eight times the thickness of the thinnest outside plate but not greater than 5" (125 mm) for all bolt sizes.			

556.03.19 BEARING AND ANCHORAGE Page 270 3-1-96

Rescind the second paragraph and replace with the following:

Place masonry bearing plates on fiber-reinforced pads meeting Subsection 711.16, that project at least ½-inch (13mm) on all sides of the bearing plate.

559.03.26 PAINTING STEEL PILES AND STEEL PILE SHELLS Page 285 11-1-98

Rescind subsection 559.03.26 and replace with the following:

559.03.26 Painting Steel Piles and Steel Pile Shells.

Paint piles and pile shells having a portion of the pile exposed to the atmosphere meeting the following requirements.

A. Paint. Furnish paint meeting Subsection 710.02 (B)(4) requirements.
B. Surface Preparation. Prepare the pile surface to be painted meeting the paint manufacturer's recommendation's.
C. Painting. Follow all the paint manufacturer's recommendations for paint application. Apply paint to the piles starting 2 feet (600 mm) below the water level or ground surface to the top of the exposed steel.
   1) Shop Painting. Shop apply the first 2 paint coats to produce a minimum 12 mil (300 µm) dry film thickness. Do not paint over piles certification markings until they are inspected against the certifications. Provide a painter's certification that the paint was applied following the manufacturer's recommendations and certified test results showing the coating thickness on the piles.
   2) Field Painting. Repair paint damage due to transport and handling in the field following the paint manufacturer's recommendations before applying the finish coat.
   Use the same paint or a paint compatible with the first 2 paint coats as a finish coat. Paint the finish coat providing a minimum 4 mils (75 µm) dry film thickness.
   The Project Manager will select the finish coat color.

559.04.4 DRIVING PILES Page 286 9-1-96

Rescind Subsection 559.04.04 and replace with the following:

559.04.4 Driving Piles.

Driving pile are measured by the linear feet (meter) of piling driven into the ground below the bottom of the substructure units or below the bottom of pre-bore holes when pre-boring is required. Driving is measured to the nearest foot (.305 m).

559.05.02 ADDITIONAL REQUIREMENTS Page 287 3-1-96

Rescind the last sentence and replace with the following:

Painting of the pile(s) is incidental to and included in the cost of furnishing the pile.

603.03.3 E. STORM DRAIN MANHOLE AND TRUNKLINE CONNECTIONS Page 296 11-1-97

Add the following new Subsection:

603.03.3 E Storm Drain Manhole and Trunkline Connections.

1) Concrete Pipe to Manhole and Trunkline Connections. Install the pipe entering the manhole wall so the pipe end is flush with the inside wall of the manhole as shown in the Detailed Drawings. Grout the connection using a commercial non-shrink grout.
2) Stub Connections to Trunklines.
   a) Concrete Pipe. Place the stub pipe with the pipe end projecting a maximum 2 inches (50 mm) into the trunkline. Contour the projecting end to match the trunklines inside wall. Grout the connection using a commercial non-shrink grout.

603.03.3 F. EMBANKMENT PROTECTORS Page 296 5-1-99

Add the following new subsection:

F. Embankment Protectors. Construct embankment protectors as shown in the Detailed Drawings. Include the flared end section, the 18-inch (450 mm) CMP, the reducer and the bends in the total length of embankment protector.

603.04.1 PIPE Page 297 5-1-99

Rescind the first paragraph and replace with the following:

Pipe is measured by the linear foot (meter) in place from end-to-end of the installed structure along the bottom or pipe invert. Gasket material, specified coatings, coupling bands, bolts, bands, fittings, tees, risers, end sections, joint testing, restoring disturbed pavement, flared ends, beveled, skewed, and similar shapes or special designs, riser pipe lengths, riser tee sections and field cast concrete bends and connections are not measured separately but are included in the pipe lengths measured.

603.04.4 EMBANKMENT PROTECTORS Page 297 5-1-99

Add the following new subsection:

603.04.4 Embankment Protectors. Embankment Protectors are measured by the linear foot (meter) of installed pipe and includes all necessary hardware.

603.05.1 PAYMENT Page 297 5-1-99

Add the following to the Pay Item and Pay Unit list:

Pay Item	Pay Unit
Embankment Protector	Linear Foot (meter)

604.04 METHOD OF MEASUREMENT Page 299 5-1-99

Add the following after the first sentence:

Slotted drain, as shown in the Detailed Drawings, is measured by the linear foot (meter) and includes the end cap and the elbow connection to the inlet.

604.05 BASIS OF PAYMENT Page 299 5-1-99

Add the following to the Pay Item and Pay Unit list:

Pay Item	Pay Unit
Slotted Drain	Linear Foot (meter)

606 GUARDRAIL AND CONCRETE BARRIER RAIL Page 301 1-1-04

Rescind Section 606 and replace with the following:

SECTION 606
GUARDRAIL AND CONCRETE BARRIER RAIL

606.01 DESCRIPTION. This work is the furnishing, installing, removing, replacing and revising metal beam guardrail, cable guardrail, box beam guardrail and concrete barrier rail.

606.02 MATERIALS. Furnish metal beam guardrail, cable guardrail, box beam guardrail and concrete barrier rail materials meeting the following Section and Subsection requirements:

Steel Beam Guardrail and Fittings	705.01.1
Wood Guardrail Posts and Blocks	705.01.2
Wire Rope and Connecting Hardware	705.02
Concrete Barrier Rail	554
Box Beam Guardrail	Detailed Drawings
Guardrail Reflectors	704 and Detailed Drawings

Furnish all new materials unless otherwise specified.

606.03 CONSTRUCTION REQUIREMENTS.
606.03.1 General. Install the guardrail and concrete barrier rail meeting the Detailed Drawings and Contract requirements.

The Project Manager will establish the line and grade for the terminal sections. Establish the line and grade between the terminal sections.

Correct all vertical and horizontal mis-alignment to the specified line and grade at Contractor expense.

Complete the guardrail installation(s) within 48 hours of starting work at all locations exposed to traffic. Where difficult post placement conditions prevent completion in one working day without additional resources, place, at Contractor expense, hazard panels at maximum 50 foot (15.2 m) spacing to delineate partial installation areas when work on those installations is not active.

Excavate the postholes and drive the posts using methods and equipment that do not damage the adjacent pavement.

Stop post driving that heaves the adjacent pavement more than ½-inch (13 mm) in 10 feet (3 m), measured using a 10-foot (3 m) straightedge parallel to the pavement.

Level and repair all damaged surfaces around the installed posts as directed.

Use only steel or wood guardrail posts for new metal beam guardrail runs unless wood posts are specified.

Where the contract specifies extending an existing guardrail run, the contractor may use either the existing post type or other approved post types in the extension. Use the post type specified for terminal sections.

When wood posts and blocks are damaged, cut or bored after treatment, treat the injuries, cuts and holes with three applications of a copper naphthenate solution containing at least two percent copper metal or with chromated copper arsenate (CCA) meeting AWPA M4.

606.03.2 Installing Posts. If the posthole is excavated, compact the posthole bottom, insert the post, and backfill and compact around the post in 6-inch (155 mm) loose layers ensuring the material is at optimum moisture before placing and compacting the next layer. Maintain the post line and grade.

Always drive steel posts. Wood and concrete posts may be placed by excavating and backfilling or by driving.

Replace all posts damaged by post driving.

Maintain the post alignment as the posts are driven.

Fill the area between the surrounding ground and the post by backfilling and tamping. Re-compact the loose material around the post and level the area as directed.

Remove, replace or re-install mis-aligned, loose or damaged posts at Contractor expense.

Pilot holes approximately 6-inches (155 mm) in diameter may be used when necessary.

606.03.3 Metal Beam Guardrail Erection. Install metal beam guardrail, including the terminal sections and bridge approach sections as shown in the Detailed Drawings and meeting the Contract requirements.

Splice the metal rail sections with the lap in the direction of traffic. Locate all rail splices at the posts. Construct splices, laps, and terminal connectors as shown in the Detailed Drawings and meeting the Contract requirements. Splice the terminal connectors for attaching the rail sections to the bridge ends by lapping as shown in the Detailed Drawings.

Tighten the bolts through the splices and mounting bolts "snug tight".

Ensure the bolts project at least 1/4-inch (6 mm) beyond the nut. Place the bolt heads on the traffic side of the guardrail.

Paint holes, slots, or cut ends in metal guardrail caused during installation with an approved galvanizing paint. Spot paint all bruised, broken, scaled, or damaged spelter coating on metal parts following the paint manufacturer's recommendations after the guardrail is installed.

606.03.4 Stiffened Guardrail Sections. Construct stiffened guardrail sections as shown in the Detailed Drawings.

606.03.5 Box Beam Guardrail. Construct box beam guardrail and bridge approach sections as shown in the Detailed Drawings.

606.03.6 Cable Guardrail. Furnish and install cable guardrail and terminal sections meeting the Detailed Drawings and the contract requirements. Install the posts plumb without damaging the post and its protective coating. For terminal sections, set the end posts, backfill and machine compact the backfill material in 4-inch (100 mm) lifts.

Install reflectors meeting Section 704 requirements on every other post in the guardrail run excluding posts in the terminal sections that curve away from the driving lanes.

606.03.7 Concrete Barrier Rail. Install concrete barrier rail meeting the Contract requirements and the Detailed Drawings.

606.03.8 Reset Concrete Barrier Rail. Reset concrete barrier rail as specified in the contract.

606.03.9 Raise Guardrail. Raise the existing guardrail to the specified height.

Remove the rail elements or cable, and completely remove the post. Backfill and compact the posthole bottom, re-install the posts and compact the backfill around the post meeting 606.03.2, and replace the rail elements or cable to the specified height.

Replace all guardrail materials damaged during the work at Contractor expense.

Correct all horizontal and vertical alignment in the guardrail to the specified line and grade.

606.03.10 Remove Guardrail. Remove and salvage the existing guardrail from the specified locations meeting the applicable requirements of Section 202. Replace all guardrail damaged during removal at Contractor expense. Dispose of removed materials not designated to be salvaged.

Load all salvaged guardrail materials from the project, transport and unload it at the specified location or as directed.

Backfill and compact the postholes left from post removal using clean material or crushed base or top surfacing, to the base of the adjacent bituminous surfacing. Apply a light asphalt spray to the hole sides and bottom and backfill with asphalt surfacing. Compact the plant mix surfacing as specified.

Do not cut off and leave existing posts in place.

606.03.11 Revise Guardrail Elements. Revise the guardrail elements as specified. The items include but are not limited to bridge approach sections and terminal sections.

606.04 METHOD OF MEASUREMENT.

606.04.1 Metal Guardrail. Metal guardrail, excluding terminal sections, is measured by the linear foot (meter) from center to center of the end posts of each section.

606.04.2 Metal Guardrail Terminal Sections. Metal Guardrail Terminal sections are measured by the unit or the foot (meter) as shown in the Detailed Drawings, unless otherwise specified, for each type specified.

606.04.3 Bridge Approach Sections. Bridge approach sections, including tapered curbs, are measured by the unit for each type specified.

606.04.4 Stiffened Guardrail Sections. Stiffened guardrail sections are measured by the linear foot (meter) from center-to-center of the end posts of each stiffened section.

606.04.5 Box Beam Guardrail. Box beam guardrail is measured by linear foot (meter), excluding the terminal sections, as shown on the Detailed Drawings.

606.04.6 Box Beam Guardrail Terminal Sections. Box Beam Guardrail terminal sections are measured by the unit as shown in the Detailed Drawings for each type specified.

606.04.7 Cable Guardrail. Cable guardrail is measured by the linear foot (meter), excluding the terminal sections as shown on the Detailed Drawings.

606.04.8 Cable Guardrail Terminal Sections. Cable guardrail terminal sections are measured by the unit as shown on the Detailed Drawings.

606.04.9 Concrete Barrier Rail. Concrete barrier rail is measured by each 10-foot (3.05 m) section. Connections to the existing barriers are included in the cost of the rail.

Measurement does not include those portions of barrier constructed as an integral part of sign foundations.

606.04.10 Impact Attenuators. Impact Attenuators are measured by the unit as specified in the contract.

606.04.11 Reset Barrier Concrete Rail. Reset barrier concrete rail is measured by each 10-foot (3.05 m) section.

606.04.12 Concrete Barrier Rail Transition. Concrete barrier rail transitions are measured by each 10-foot (3.05 m) section.

606.04.13 Concrete Barrier Rail Terminal Section. Concrete barrier rail terminal sections are measured by each 10-foot (3.05 m) section.

606.04.14 Raise Guardrail. Raise guardrail, including terminal sections, is measured by the linear foot (meter) from center-to-center of the end posts of each section.

606.04.15 Remove Guardrail. Remove guardrail is measured by the linear foot (meter) from center-to-center of end posts of each section removed.

606.04.16 Remove Concrete Barrier Rail. Remove concrete barrier rail is measured by each 10-foot (3.05 m) section.

606.04.17 Revise Guardrail Elements. Revise guardrail elements is measured by each element revised, as specified in the Contract.

606.05 BASIS OF PAYMENT. Payment for the completed and accepted quantities is made under the following.

Pay Item	Pay Unit
Metal Guardrail	Linear Foot (meter)
Metal Guardrail Terminal Section	Each or Linear Foot (meter)
Bridge Approach Section	Each
Stiffened Guardrail Sections	Linear Foot (meter)
Box Beam Guardrail	Linear Foot (meter)
Box Beam Guardrail Terminal Section	Each
Cable Guardrail	Linear Foot (meter)
Cable Guardrail Terminal Section	Each
Concrete Barrier Rail	Each
Impact Attenuators	Each
Reset Concrete Barrier Rail	Each
Concrete Barrier Rail Transition	Each
Concrete Barrier Rail Terminal Section	Each
Raise Guardrail	Linear Foot (meter)
Remove Guardrail	Linear Foot (meter)
Remove Concrete Barrier Rail	Each

Revise guardrail elements is paid for under the appropriate "Bridge Approach Section" each, or "Guardrail Terminal Section" each.

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the Contract.

608.03.2 CONCRETE Page 311 5-1-99

Add the following after the fifth sentence:

Submit the method of contrast for the curb ramps, at least 10 calendar days before construction, to the Project Manager for approval if not specified in the contract.

608.04 METHOD OF MEASUREMENT Page 311 3-1-00

Rescind the second sentence and replace with the following:

Contracts for sidewalk work only: Reinforcing steel, expansion joint material, excavation, backfill, crushed gravel base, curb ramp contrast method, and disposal of material associated with the work are not measured for payment.

All other contracts: Reinforcing steel, expansion joint material, crushed gravel base, and curb ramp contrast method are not measured for payment. Excavation, backfill and disposal of material associated with the work are measured by the cubic yard (cubic meter).

608.05 BASIS OF PAYMENT Page 311 3-1-00

Rescind the second sentence in the paragraph under the Pay Item/Pay Unit columns and add the following.

Contracts for sidewalk work only: Reinforcing steel, expansion joint material, excavation, backfill, crushed gravel base, curb ramp contrast method, and disposal of material associated with the work are paid under Sidewalk-concrete.

All other contracts: Include the cost of reinforcing steel, crushed gravel base, curb ramp contrast method, expansion joint material in the contract unit price bid for Sidewalk-Concrete. Excavation, backfill and disposal of material associated with the work are paid for under the specified type of excavation.

610.03.1 TOPSOILING. Page 315 2-1-01

Rescind the last paragraph and replace with the following:

Remove and dispose of, at Contractor expense, all clods, rocks, large roots, litter, and other foreign material exceeding four inches (100 mm) in its greatest dimension from the topsoil before placing it on the roadway and before final acceptance. Break up the topsoil to an average 4 inches (100 mm) deep.

611.02.4 PREFABRICATED CATTLE GUARDS Page 321 3-1-00

Rescind Subsection 611.02.4 and replace with the following:

611.02.4 Cattle Guards. Furnish standard pre-fabricated cattle guards meeting the following requirements:

- HS 20 (M 518) Live Loading
- The Detailed Drawings
- Subsection 556.03.2, 556.03.3

Submit all fabrication drawings for review before fabrication and footing elevations are set.

612.03.4 REMOVING LEAD BASED PAINT Page 324 10-1-04

Rescind subsection 612.03.4A and add the language to the beginning of 612.03.4B. Work Plan:

B. Work Plan. Submit two copies of a work plan that meets OSHA and EPA regulations, for lead paint removal work at the Pre-Construction Conference.

Work plans will be reviewed for acceptance within ten working days of receipt. The Project Manager will notify the Contractor in writing of the work plan acceptance or rejection. Rejected work plans may be re-submitted but must be approved by the Project Manager at least ten working days before beginning any lead paint removal work.

612.03.5 B.1. APPLICATION Page 326 2-1-98

Rescind the first sentence and replace with the following:

Apply three coats of paint to new structural steel specified to be painted.

612.03.5 B.2. SHOP PAINT Page 326 2-1-98

Rescind the first sentence and replace with the following:

Apply one coat of zinc rich primer to all steel surfaces specified to be painted, except surfaces in contact after erection.

612.03.5 B.4.b. ACCESSORY PREPARATIONS AND SPOT PAINTING Page 327 2-1-98

Rescind the first sentence of the second paragraph and replace with the following:

Apply only the primer shop coat to the exposed surfaces of bridge deck and approach slab guard angles, expansion devices, and armored joints embedded in the roadway surface.

613.03.4 CONCRETE DRAINAGE CHUTE Page 330 5-1-99

Add the following new subsection:

613.03.4 Concrete Drainage Chute. Construct concrete drainage chutes as shown in the Detailed Drawings.

613.04.01 RIPRAP Page 300 2-1-04

Rescind Subsection 613.04.1 and replace with the following:

613.04.1 Riprap.

A. Handlaid and Random Riprap. Handlaid and random riprap is measured by the cubic yard (cubic meter) to the nearest cubic yard (cubic meter) complete in place. The volume measured for payment is that bounded by the staked length and height and the plan thickness.

Excavation is incidental to riprap and not measured for payment.

B. Grouted Riprap. Grouted riprap is measured by the square yard (square meter) to the nearest square yard (square meter) on the face of the revetment.

Excavation is incidental to and not measured for payment.

Bedding material is measured by the cubic yard (cubic meter) to the nearest cubic yard (cubic meter).

613.04.02 BANK PROTECTION Pgs 330-331 2-1-04

Rescind subsection 613.04.2 and replace with the following:

613.04.2 Bank Protection. Bank protection is measured by the cubic yard (cubic meter) to the nearest cubic yard (cubic meter) complete in place. The volume measured for payment is that bounded by the staked length and height and the plan thickness.

Excavation and bedding material is not measured for payment.

613.04.4 CONCRETE DRAINAGE CHUTE Page 331 5-1-99

Add the following new subsection:

613.04.4 Concrete Drainage Chute. Concrete drainage chutes are measured by the cubic yard (cubic meter) and includes the excavation, concrete placement and bank protection at the chute end.

613.05 BASIS OF PAYMENT Page 331 5-1-99

Add the following to the Pay Item and Pay Unit list:

Pay Item	Pay Unit
Concrete Drainage Chute	Cubic Yard (cubic meter)

615 IRRIGATION FACILITIES AND HEADWALLS Page 334A 3-1-96

Add the following new Section:

615.01 Description. Irrigation facilities and headwalls is furnishing and constructing irrigation structures meeting these specifications and the Contract requirements.

615.02 Materials. Furnish material meeting the contract requirements and the following:

Concrete, Class “DD”.....Section 551

615.03 Construction Requirements. Construct irrigation facilities and headwalls meeting the contract requirements and the following.

Excavate meeting the applicable Section 209 requirements. Construct and install concrete structures meeting the applicable Section 552 requirements. Place reinforcing steel as shown in the contract. Moisten all surfaces where concrete is to be placed before the concrete is placed.

615.04 Method of Measurement. Concrete is measured under Subsection 552.04. Reinforcing steel is incidental to concrete and not measured for payment. Excavation is incidental to the work and is not measured for payment.

615.05 Basis of Payment. Payment for the completed and accepted quantities is made under the following:

Pay Item	Pay Unit
Concrete	See Subsection 552.05

Payment at the contract unit price is full compensation for all necessary resources to complete the item of work under the Contract.

617.03.6 FOUNDATIONS Page 341 7–1–99

Add the following after the second paragraph:

Install luminaire and Type 1 signal foundations to ensure that no portion of the foundation or base that is non-breakaway projects more than 4–inches (100 m) above the ground line.

617.03.14 SALVAGING AND REINSTALLING ELECTRICAL EQUIPMENT Page 343 7-1-99

Add the following:

C. Remove and Re-set Existing Poles and Standards. Remove the specified poles and standards, including their attachments from the existing locations and re-set them at the specified new locations. Remove the existing foundation, backfill and compact the hole, and dispose of the old foundation. Remove the existing wiring from the poles and standards and replace with new wiring, making all connections. Furnish four high strength anchor bolts, as specified, and two nuts and two washers for each bolt for the new foundation. Ensure the top 12-inches (300 mm) of the bolt is galvanized. Install a new foundation meeting subsection 703.05 at the specified locations. Meet all the applicable Section 617 requirements for the re-set installation.

617.03.15 ROAD CLOSURE GATE ASSEMBLIES Page 343 5-1-99

Add the following new subsection:

617.03.15 Road Closure Gate Assemblies. Furnish and install road closure gate assemblies meeting the Contract requirements and as shown in the detailed Drawings.

617.04.2 UNIT BASIS Page 344 5-1-99

Add the following to the list in item 4:

Road Closure Gate Assemblies

617.04.2 4. UNIT BASIS Page 343 7-1-99

Add the following to the list:

Remove the Re-set Existing Pole (foundation measured separately).

617.05.2 UNIT BASIS Page 344 7-1-99

Add the following to the Pay Item and Pay Unit lists:

Pay Item	Pay Unit
Road Closure Gate Assembly	Each
Remove and Re-Set Existing Pole	Each

618.02 MATERIALS Page 347 8-1-04

Rescind subsection 618.02 and replace with the following:

618.02 MATERIALS. Furnish materials meeting the Contract requirements, MUTCD, and the following:

Reflective Sheeting	Subsection 704.01.10
Temporary Pavement Marking Tape	Subsection 714.01
Temporary Pavement Marking Tabs	Subsection 714.02
Preformed Plastic Pavement Markings	Subsection 714.03
Temporary and Interim Traffic Paint	Subsection 714.04
Signs and Channelizing Devices	Subsection 715.01
Portable Sign Support Assemblies	Subsection 715.02
Advance Warning Arrow Panels	Subsection 715.03
Warning Lights	Subsection 715.04
Flagger Ahead Warning Signs	Subsection 715.05

618.03.6 ACCESS BREAKS Page 348 6-1-00

Rescind subsection 618.03.6 and replace with the following:

618.03.6 Access Breaks. Submit a written proposal on the “Request for Access Break Approval” form, available from the Project manager, for temporary breaks in interstate access control or right-of-way fences to the Project Manager for approval. See the form for access breaks requiring F.H.W.A. approval. Include all information requested on the form.

Provide a written narrative that describes how the traffic control plan addresses traffic safety and minimizes delay to the mainline traffic. Ensure the plan meets the MUTCD and the departments Detailed Drawings requirements.

Do not begin work on the access break until the department has returned an approved proposal. Obtain the Project Manager's approval for all modifications to the original plan and submit the changes in writing.

Assume all costs associated with the access break including the traffic controls and the restoration of the area once the access break is removed.

618.03.8 TRAFFIC CONTROL AT DROP-OFF AREAS Page 350 10-1-02

Rescind Subsection 618.03.8 entirely and replace with the following:

618.03.8 Traffic Control at Drop-Off Areas.

When existing slopes are 3:1 or flatter, temporarily fill constructed drop-offs within 30 feet (10m) of the edge of travel lanes used by traffic to a 3:1 slope or flatter at the close of work each day. Furnish and install, at Contractor expense, channelizing devices for slopes not temporarily filled to a 3;1 or flatter.

Temporary filling of drop-offs protected by positive barriers is not required.

When existing slopes are steeper than 3:1, temporarily fill constructed drop-offs within 30 feet (10m) of the edge of travel lanes used by traffic that matches or is flatter than the existing slope at the close of work each day. Furnish and install at Contractor expense, channelizing devices for slopes not temporarily filled to match, or are steeper than the existing slope.

Temporary filling of drop-offs protected by positive barriers is not required.

Determine device spacing using the following formula:

$$\text{Factor in Feet (meters)} = \frac{A \times C \times W}{S \times D}$$

Where: A = Average Daily Traffic Adjustment
C = Degree of Curvature (metric radius factor)
W = Recoverable Width, 4:1 or flatter, in feet (meters) from the drop-off to the far edge of the adjacent traffic lane (s) with the same direction of traffic.
S = Posted Speed in M.P.H. (K.P.H.)
D = Average drop-off depth in inches (mm)

Use the following C factor for drop-offs outside of horizontal curves:

Degree of Curve	C	Metric Radius	C
Less than 2	5800	Greater than 900m	241,000
2 to less than 4	5200	900m to more than 450m	218,000
4 to less than 6	4900	450m to more than 300m	203,000
6 or greater	4500	300m or less	188,000

Use the C factor for curves less than 2º curves (greater then 900 m) for drop-offs on the inside of horizontal curves. Use the following Average Daily Traffic (ADT) adjustment:

ADT	A
Under 750	1.50
750 - 1499	1.30
1500 - 5999	1.00
Over 6000	0.90

Round the computed spacing to the nearest 10 feet (3 m).

Use the following to determine the device type using the spacing factor:

400 feet (122 m) or greater - flexible guideposts or standard delineators.
40 feet (12 m) to 390 feet (119 m) - 12-inch (305 mm) by 36-inch (915 mm) vertical panels.
20 feet (6 m) to 30 feet (9 m) - Type C steady burn warning lights on alternate panels.
Less than 20 feet (6 m) - use positive barrier if 48 hours will lapse before filling.

Space devices at the spacing factor. If W is less than 14 feet (4 m) do not exceed spacing in feet (m) that is double the posted speed in miles per hour. Do not space vertical panels less than 40 feet (12 m).

618.03.10 TEMPORARY PAVEMENT MARKING REQUIREMENTS Page 351 8-1-04
Rescind and Vacate 618.03.10 (see 620.03.3 and 620.03.4)

618.03.11 A. TWO LANE TWO WAY AND MULTIPLE-LANE TWO LANE ROADWAYS Page 353 3-1-00

Rescind Subsection 618.03.11(A) and replace with the following:

A. Two-Lane Two-Way and Multiple-lane Two-Way Roadways. Control traffic with pilot cars for the first 48 hours, or longer as directed, after the seal coat is applied. The 48 hours begin at the end of the Contractor's work shift in each six mile (9.6 km) section.

The Department will pay for all pilot cars, flaggers, signs and devices used for the initial 48 hours of pilot car operation on each six consecutive roadway miles (9.6 km) of seal and cover work and on any remaining section less than six miles (9.6 km).

Pilot car operation beyond 48 hours, unless ordered by the Project Manager, is at Contractor expense.

Pilot car use may be discontinued after 48 hours if the pavement markings are in place.

Place the final pavement markings before terminating pilot car use within each six mile (9.6 km) or fractional section.

If striping is not placed within seven calendar days the Department will have the work performed and deduct the costs from monies due the Contractor.

Terminating pilot car use is the end of the initial 48 hours of pilot car operation or when its terminated by the Project Manager.

Place "LOOSE GRAVEL" (W8-7) signs, each with a 30 x 30-inch (760 X 760 mm) advisory speed plate "35 MPH" (W13-1), at each end of each work zone. Place the same sign combination for each direction of travel at 2 mile (3.2 km) intervals within the work zone. Leave the signs in place until all sweeping and pavement markings within the zone are completed.

Place additional work zone signing when sweeping work is performed outside the flagger and pilot car area.

618.03.11 B. INTERSTATE HIGHWAYS Page 353 8-1-01

Rescind (B) Interstate Highways in 618.03.11 and replace with the following:

B. Interstate Highways. Use lane closures and lane control devices for seal and cover operations on interstate highways. Do not use pilot cars unless directed.

Place "LOOSE GRAVEL" and "45 MPH" signs as specified for two-way roadways. Sign both sides of the roadway. The Project manager may adjust the speed limit to prevent damage to the road surface, vehicles, and to improve traffic flow.

Remove the speed signs 24 hours after opening the road to traffic or as directed.

Place pavement markings meeting Section 620 before removing the traffic controls and within three days of completing the seal coat work.

618.03.12 TRAFFIC CONTROL FOR STRIPING OPERATIONS E. Page 354 2-1-01

Add the following under 618.03.12 D:

E. Furnish and operate a shadow truck equipped with a truck-mounted attenuator meeting the National Cooperative Highway Research Council (NCHRP) 350 standards and the appropriate test level. Use the truck to follow within 45 to 90 meters of pavement marking removal and application, placing and removing traffic cones that protect the pavement markings. Include all costs associated with this work in the respective bid item.

618.03.16 WATER FOR DUST CONTROL Page 355 12-1-01

Rescind Subsection 618.03.16 and replace with the following:

618.03.16 Water For Dust Control. Furnish, haul, and apply dust control of water using tank trucks equipped with spray systems that uniformly distributes the water over the application area. Discontinue watering as directed.

618.04.2 TEMPORARY PAVEMENT MARKINGS Page 355 8-1-04

Rescind subsection 618.04.2 and vacate. (See subsection 620.04)

618.04.3 FLAGGING Page 356 3-1-00

Rescind Subsection 618.04.3 and replace with the following:

618.04.3 Flagging. Flagging is measured by the hour for the actual number of approved flagging hours provided on the project for each flagger used.

Travel time for flaggers to and from the project is not measured for payment.

618.04.5 WATER FOR DUST CONTROL Page 356 12-1-01

Rescind Subsection 618.04.5 and replace with the following:

618.04.5 Water For Dust Control. Dust control water is measured by the 1000 gallon (1 KL) unit used and accepted.

Measurement will be by an approved meter, load counter or by manual count of the number of loads of a known quantity applied on the roadway.

No measurement is made of water used other than for dust control for environmental compliance and convenience for the traveling public.

618.05.1 TRAFFIC CONTROL DEVICES Page 356 8-1-04

Rescind the Pay Item for Temporary Pavement Markings in Section 618.05.1. (See subsection 620.05)

619.03.2 DESIGN CALCULATIONS AND SHOP DRAWINGS Page 359 5-1-01

Rescind the first paragraph of subsection 618.03.2 and replace with the following:

The department will furnish the sign design calculations for the project at the pre-construction conference. The furnished sign design calculations will include the calculations for the specified guide signs, special design signs, and other signs shown in the Montana Sign and Sign Materials book but not include those signs in the FHWA Standard Highway Signs Book.

619.03.6 REMOVE AND RE-SET SIGNS Page 361 8-1-97

Change the title "Remove and Re-Set Signs" to read "Replace, Re-Use, and Re-Set Signs."

619.03.11 PERMANENT BARRICADE Page 362 5-1-99

Add the following new subsection:

Permanent Barricade. Furnish and install permanent barricades as specified and shown in the Detailed Drawings.

619.04.2 METAL POSTS Page 362 3-1-00

Rescind Subsection 619.04.2 and replace with the following:

Metal posts are measured by the pound (kilogram). The pay weight is calculated by multiplying the nominal weight per foot (meter) by the installed length of each post from the top of the breakaway device up.

If there is no Breakaway System bid item, include in the post weight the breakaway device, fuse plate, and stub post including the embedment length .

Breakaway systems, bid as a separate item, are measured per each and include the breakaway device, fuse plate, and stub post including the embedded length.

619.04.4 DELINEATORS Page 362 3-1-00

Rescind Subsection 619.04.4 and replace with the following:

619.04.4 Delineators and Reference Markers. Delineators and reference markers of each type specified are measured by the unit and include the reflector, reference sign, mounting hardware, and post, complete in place.

Removal of the existing delineators and reference markers is not measured for payment.

619.04.6 REMOVE AND RE-SET SIGNS Page 362 8-1-97

Change the title "Remove and Re-Set Signs" to read "Re-Set Signs."

619.04.12 PERMANENT BARRICADE Page 363 5-1-99

Add the following new subsection:

619.04.12 Permanent Barricade. Permanent barricade, as shown in the Detailed Drawings, is measured by the linear foot (meter) of the barricade width and includes all materials for the barricade.

619.05 BASIS OF PAYMENT Page 363 9-1-00

Rescind the Pay Item, “Delineators”, and replace with “Delineator and Reference Markers”.

Change the Pay Item "Remove and Re-Set Signs" to read "Re-Set Signs."

Add the following to the Pay Item and Pay Unit list:

Pay Item	Pay Unit
Permanent Barricade	Linear Foot (meter)

620 PAVEMENT MARKING APPLICATION Page 365 8-1-04

Rescind Section 620 and replace with the following:

SECTION 620
PAVEMENT MARKING APPLICATION

620.01 DESCRIPTION. This work is the application of temporary, interim and final pavement markings.

Temporary pavement markings consist of the centerline markings for two-lane two-way roadways; lane line markings for divided four-lane two-way interstates, and centerlines and lane lines for two-way undivided three or more lane urban roadways. Divided roadways are roadways where the paved surface for each direction of travel is physically separated by an unpaved section.

Interim pavement markings consist of all longitudinal pavement markings (centerlines, edge lines (shoulder lines), lane lines, etc.) and words and symbols identical to the final pavement marking configuration.

620.02 MATERIALS. Furnish materials meeting the following requirements:

Temporary Pavement Marking Tape	Subsection 714.01
Preformed Plastic Pavement Marking Material	Subsection 714.03
Temp and Interim Traffic Paint	Subsection 714.04
Epoxy Pavement Marking	Subsection 714.08
Reflective Glass Beads	Subsection 714.05
Reflective Thermoplastic Pavement Markings	Subsection 714.06

Furnish hot inlaid Hydrocarbon-Based thermoplastic for all plastic pavement marking bid items unless otherwise specified.

620.03 CONSTRUCTION REQUIREMENTS.

620.03.1 General. Furnish the Project Manager a manufacturer’s material certification at least 10 calendar days before the material is delivered to the project. Do not apply materials that do not meet the contract requirements. The Project Manager may request a manufacturer’s sample or take field samples for testing. Furnish a material sample weighing at least two pounds (0.91 kg). Provide the Project Manager five calendar days advance notice before striping work begins.

620.03.2 Layout of Pavement Markings. Be responsible for establishing all horizontal controls for line placement. The Project Manager will check the layout of the final striping before placement begins.

Establish and maintain pavement marking control lines within 0.25 feet (75 mm) of the true line.

Apply the centerline and shoulder lines within 0.30 feet (90 mm) of the true line. Ensure the stripe does not deviate by more than 0.15 foot (50 mm) in 500 feet (152 m).

The Project Manager will select a random location for each mile to check accuracy of the applied markings.

Remove and replace out of specification pavement markings as directed at Contractor expense.

620.03.3 Temporary and Interim Pavement Markings.

A. Materials. Furnish materials meeting subsection 714.04 requirements.
B. Equipment. Use equipment manufactured to apply the material type. Ensure the equipment prevents paint spray or bead loss outside the specified line width. Equip the pavement-marking machine with a flow meter and totalizer that measures paint quantities in gallons (liters), to the nearest 0.1-gallon (0.1 L). Calibrate the flow meter before use on the project and when directed. Locate the flow meter in the flow line to the spray nozzles. Locate the totalizer where it can be easily read. Ensure the calibration adjustment is accessible without meter removal or using a calibration adjustment device.

Marking material quantities will be verified by measuring equipment’s calibrated paint tank(s) and the tank manufacturer’s measuring device. The Project Manager will visually witness tank stabs at the

beginning and end of each work shift, any time additional paint is added to the tank, at the beginning and end of each route/road segment on contracts with multiple route/road segments, at the beginning and end of each certified paint lot, and at other intervals as necessary. In the event that there is a difference between the totalizer and tank stab measurements, the lesser quantity will be used for payment.

Provide the Project Manager calibration certificates from an independent agent for the paint tank at least 10 calendar days before striping on the project begins. Re-certify the tank at the beginning of each year before using the equipment on Department contracts. The Project Manager may inspect the tank before each use and as determined necessary.

Stop bars, crosswalks, and symbols may be applied with hand-operated equipment.

Terminate marking application when the equipment fails to apply the markings meeting the contract requirements. Make equipment adjustments and resume striping.

C. Surface Preparation and Weather Limitation. Clean the surface to be painted meeting the paint manufacturer's recommendations. Inform the Project Manager and modify, when required, the surface preparation to ensure optimal bonding of the marking to the surface and to provide the specified marking requirements.

Apply the material following the paint manufacturer's recommendations.

Apply pavement markings during daylight hours only. Obtain the Project Manager's approval to apply pavement markings any other time.

D. Application. Apply the markings to within ±¼-inch (6 mm) of the specified width.

1. Temporary Pavement Markings. Apply a 10 mil ± 1 mil (0.254 mm ± 0.025 mm) thick wet film immediately followed by applying at least 6 lbs/gallon (0.72 kg/L) of glass beads to temporary pavement markings on all sections of newly constructed pavement before opening to traffic. This includes detours, transitions, and all pavement lifts open to traffic. Temporary pavement markings may be used for a maximum 10 calendar days on pavements under traffic.

   Remove, at Contractor expense, all temporary pavement markings that conflict with interim or final pavement markings. Remove conflicting temporary stripe(s) the same day the interim or final markings are applied.

2. Interim Pavement Markings. Apply a 16 mil ± 1mil (0.406 mm ± 0.025 mm) thick wet film immediately followed by applying at least 8 lbs/gallon (0.96 kg/L) of glass beads. Apply interim pavement markings no later than 10 calendar days after the application of temporary pavement markings.

   Stripe newly constructed pavements, including partially completed sections. Apply the interim pavement markings matching the final pavement marking configurations and locations. Interim pavement markings placed prior to chip seal may be offset as approved by the Project Manager.

   The Project Manager will suspend all remaining contract work if the interim striping is not applied within the time specified above.

620.03.4 Pavement Marking Tape. Furnish Materials meeting subsection 714.01. Follow the tape manufacturer's recommendations for road surface preparation and installation. Install the tape meeting the contract requirements.

620.03.5 Preformed Plastic Pavement Marking Materials. Apply pavement markings up to 8-inches (205 mm) wide in a single application to the specified width. Apply pavement markings over 8-inches (205 mm) wide in 6-inch or 8-inch (155 or 205 mm) multiple applications and minimum fractional 4-inch (100 mm) applications.

Apply the marking material at the thickness specified in the Contract.

Cut and true the marking material edges.

Apply inlaid plastic pavement marking materials into the new asphalt pavement just before final compaction and roll it flush with the roadway surface during the final plant mix compaction.

620.03.6 Epoxy Pavement Markings.

A. Materials. Furnish Materials meeting subsection 714.08 requirements.

B. Equipment. Ensure the epoxy application equipment accurately meters the two components and produces and maintains the mixing head temperature, all meeting the epoxy manufacturer's specifications. Ensure the application equipment is acceptable to the marking manufacturer.

   Use equipment manufactured to apply the material type. Ensure the equipment prevents paint spray or bead loss outside the specified line width. Equip the pavement-marking machine with a flow meter and totalizer that measures paint quantities in gallons (liters), to the nearest 0.1-gallon (0.1 L). Calibrate the flow meter before use on the project and when directed. Locate the flow meter in the flow line to the spray nozzles. Locate the totalizer where it can be easily read. Ensure the calibration adjustment is accessible without meter removal or using a calibration adjustment device.

   Marking material quantities will be verified by measuring equipment's calibrated paint tank(s) and the tank manufacturer's measuring device. The Project Manager will visually witness tank stabs at the beginning and end of each work shift, any time additional paint is added to the tank, at the beginning and end of each route/road segment on contracts with multiple route/road segments, at the beginning and end of

each certified paint lot, and at other intervals as necessary. In the event that there is a difference between the totalizer and tank stab measurements, the lesser quantity will be used for payment.

Provide the Project Manager calibration certificates from an independent agent for the paint tank at least 10 calendar days before striping on the project begins. Re-certify the tank at the beginning of each year before using the equipment on Department contracts. The Project Manager may inspect the tank before each use and as determined necessary.

Stop bars, crosswalks, and symbols may be applied with hand-operated equipment.

Terminate marking application when the equipment fails to apply the markings meeting the contract requirements. Make equipment adjustments and resume striping.

C. Surface Preparation and Weather Limitation.

1. General. Clean the surface to be painted meeting the paint manufacturer's recommendations. Inform the Project Manager and modify, when required, the surface preparation to ensure optimal bonding of the marking to the surface and to provide the specified marking requirements.

Apply pavement markings during daylight hours only. Obtain the Project Manager's approval to apply pavement markings any other time.

Grind all surfaces within 10 calendar days before applying the pavement marking.

Grinding is surface abrasion 30 mils ± 10 mils (0.762 mm ± 0.254 mm) deep to provide a roughened surface free of loose paint chips, loose seal aggregate and surface debris. Removal depth is measured vertically, from the bottom of a three-foot (0.92 meter) or longer straight edge placed on the roadway surface, to the ground surface. Immediately stop grinding if the depth exceeds 40 mils (1.016 mm) and make adjustments to meet the specified grind depth.

2. Concrete Surfaces. Prepare existing concrete surfaces meeting (1) above. Grind concrete surfaces 20 mils ± 10 mils (0.508 mm ± 0.254 mm) deep to provide a roughened surface free of loose paint chips and surface debris. Do not grind and apply pavement markings on concrete until 15 calendar days after new concrete has been placed.

3. Removal Limits. Meet the following removal limits:

- Do not grind more than 1 inch wider (25 mm) than the existing stripe.
- Do not grind more than 4 inches (100 mm) from the beginning or end of the stripe being removed.

4. Disposal. Collect and dispose of all removed material and new traffic marking materials spilled during the work. Process, handle, transport, and dispose of the materials meeting the current applicable solid waste laws and regulations.

D. Application.

1. Apply epoxy pavement markings a minimum of 30 calendar days, and a maximum of 45 calendar days, after seal coat operations through sweeping are completed. When epoxy pavement markings are the only remaining item of work on the project, contract time assessment will be suspended until either, beginning epoxy pavement marking application, or 45 calendar days elapse after seal coat operations are completed.

2. Application Instructions. Provide the Project Manager a copy of the manufacturer's instructions for surface preparation and material application at least 24 hours before application work begins.

Include in the instructions:

- Equipment Requirements
- Approved Work Methods and Procedures
- Material Application Range
- Ambient & Surface Temperature Requirements
- Weather Limitations
- Precautions
- All other requirements for successful application and material performance.

Do not place materials before furnishing complete instructions to the Project Manager.

Apply a 20-mil ± 2 mil (0.508 mm ± 0.051 mm) thick wet film immediately followed by applying at least 25 lbs/gallon (3 kg/L) of glass beads to the epoxy.

Immediately terminate striping application if the applied stripe(s) are less then 18 mils thick. Grind all 18 mil and thinner striping meeting subsection 620.03.6 C and replace the striping meeting the contract requirements at Contractor expense. Correct all deficient striping before continuing with the remaining striping work. The Project Manager will identify deficient stripe thickness by comparing the tank quantities measured and used against the length, width, and application rate of the applied stripe.

Apply the epoxy pavement marking material when the pavement is dry and the ambient temperature is 40˚F (4.4˚C) and rising or follow the manufactures surface and temperature requirements, whichever is more restrictive.

a. Pavement Marking Application. Match the existing pavement marking configuration unless otherwise specified or directed.

E. Marking Protection. Furnish all traffic control necessary to protect the new stripe until it will not track. Include the traffic control costs in the unit price bid for the pavement marking.

620.03.7 Thermoplastic Pavement Marking.

A. General. The applicable requirements of Subsection 620.03.1 apply to placing thermoplastic marking material.

B. Material Acceptance. Furnish the Project Manager copies of the manufacturer's product specification data at least 10 calendar days before the material is delivered to the project. Do not place materials before furnishing complete specifications to the Project Manager.

Do not apply materials not meeting the contract requirements.

The Project Manager may request a manufacturer's sample or take field samples at the point of application for testing.

The Department may test samples for one or any combination of the specified requirements.

Remove and replace material represented by failing samples at Contractor expense.

C. Manufacturer's Instructions. Submit the manufacturer's instructions for surface preparation and material application before applying the marking material.

Include the following:

- Equipment Requirements;
- Work Methods and Procedures;
- Material Application Temperature Range;
- Ambient and Surface Temperature Requirements;
- Weather limitations;
- Precautions; and
- All other requirements necessary for successful application and satisfactory performance.

Do not place materials before furnishing complete instructions to the Project Manager.

D. Surface and Temperature Requirements. Prepare the surface before application and apply the marking material meeting the manufacturer's recommendations.

Meet the following unless otherwise recommended by the manufacturer:

1. Apply the material when ambient air and pavement surface temperature is at least 60°F (16°C).
2. Ensure the pavement surface, including grooved pavement for inlay applications, is dry during application.

The inspector will perform a visual sight and touch inspection to ensure the surface is free of moisture. If a question exists concerning the pavement dryness, the following test may be performed. Tape a piece of aluminum foil, roofing paper, or clear plastic wrap to the pavement surface. Wait approximately 15 minutes. Do not apply markings if moisture appears beneath the material.

E. Temperature Monitoring and Heating Equipment. Equip melting and application equipment for marking material with permanently attached, easily read thermometers that provide a true, continuous, representative temperature of the material.

Use a heating kettle that provides indirect heat to melt the marking material.

Ensure the pre-melting kettles have rotating agitators that stir the marking material during heating.

F. Surface Preparation. Follow the manufacturer's surface preparation instructions.

G. Primer/Sealer. Follow the pavement marking manufacturer's recommendations for primer/sealer application. If no recommendations are made, apply a thin, uniform coat of SS-1 or CSS-1 on the pavement surface and grooved areas before applying the pavement marking. Insure the emulsion has broken before application of the pavement markings.

H. Application. Apply thermoplastic pavement markings a minimum of 30 calendar days, and a maximum of 45 calendar days, after seal coat operations through sweeping are completed. When thermoplastic pavement markings are the only remaining item of work on the project, contract time assessment will be suspended until either, beginning thermoplastic pavement marking application, or 45 calendar days elapse after seal coat operations are completed.

Table 620-1
THICKNESS OF INLAID THERMOPLASTIC MARKINGS

400 Mils (10 mm)	275 Mils (7 mm)
Words and Symbols	Median Borders
Crosswalks	Continuous Centerline
Stop Bars	Dashed Centerline
8" White Lane Lines	Dashed Lane Lines
Dotted or Skip Lines	Shoulder Lines

Produce thermoplastic markings having straight and uniform edges that adhere to the pavement.

Finish the extruded lines, including words and symbols at least ¼-inch (6 mm) wider than the groove widths at each edge and within the ranges shown in Table 620-2.

TABLE 620-2
ALLOWABLE MARKING WIDTH/GROOVE WIDTH
TOLERANCE RANGES

SPECIFIED WIDTH	GROOVE WIDTH	FINISHED *MARKING WIDTH
4" (100 mm)	3½" - 4" (90-100 mm)	4" – 4½" (100-115 mm)
8" (205 mm)	7½" - 8" (190-205 mm)	8" – 8½" (205-215 mm)
24" (610 mm)	23½" - 24" (600-610 mm)	24" – 25½" (610-650 mm)

Ensure the finished marking does not exceed ¼-inch (6 mm) wider than the finished width.

Match the FHWA manual "Standard Alphabets For Highway Signs and Pavement Markings" for words and symbols. Produce the markings within ¼-inch (6 mm) per 4-inches (100 mm) of width.

Use templates to extrude words and symbols that are larger than the grooves and meet the tolerance ranges in Table 620-2 to provide the required edge sealing.

Clean the grooves before placing the thermoplastic material. Meet the surface requirements in Subsection 620.03.05 (D).

Apply thermoplastic material in grooves within 24 hours of grooving.

Keep traffic out the grooves and re-clean them as necessary before applying the thermoplastic material.

I. Glass Bead Application. Apply glass beads by drop-on methods immediately after the thermoplastic material application meeting Subsection 620.03.05 (H) requirements.

Apply glass beads using at least 6 pounds per 100 square feet (0.30 kg per square meter) of thermoplastic material. The Project Manager may increase the glass bead application rate.

J. Marking Protection. Protect the thermoplastic pavement markings from traffic until it has set as specified in Article 4.3.2 of AASHTO M 249.

K. Markings - Dimensional Tolerances. Finish the markings to the specified minimum cross sectional hardened thickness.

Trim lines, words, and symbols to produce sharp, neat lines on all sides and ends.

Meet a linear tolerance of plus or minus 6-inches (155 mm) over each cycle on specified broken-line patterns.

Meet Table 620-2 tolerances for finished line widths.

L. Joints. Meet the following requirements for joints in the finished extruded thermoplastic markings:

1. Extrude transverse markings full width with a maximum of one transverse joint per length of line.
2. Apply words and symbols free of joints within each symbol, letter, or numeral. Letters made with one or more straight legs (A,L,N,T, etc.) and combination arrows (through and right or through and left, etc.) may be applied with one pass per leg. Combination arrows may be applied with one pass for each arrowhead of the marking.
3. Extrude 4 and 8-inch (100 and 205 mm) longitudinal lines full width in one pass with no transverse joints. Transverse joints are acceptable only for lines exceeding 100 feet (30.5 m) in length and lines shorter than 100 feet (30.5 m) that require a change of direction in the application equipments path.
4. Extrude lines 24-inches (610 mm) wide full width in one pass with a maximum of one transverse joint per length of line.

Finish joints to form neat lines without gaps or unevenness and that are moisture proof.

M. Patching and Repairing. Use material from the same batch of thermoplastic material used in the original work. The patching or repair may be performed mechanically or manually. Re-apply the beads as specified. Meet all specified dimensional tolerances and match the original lines.

N. Cleaning and Trimming of Markings. Remove irregularities in finished markings without chipping, cracking, or other damage to the markings or causing delaminations or separations between the pavement and marking material. Follow the manufacture's recommendations for marking cleaning and trimming. Do not damage the pavement or thermoplastic material.

620.03.8 Pavement Marking on Concrete Curbs. Clean the concrete surfaces meeting the paint manufacturer's recommendations. Do not apply pavement markings on concrete until 15 calendar days after the concrete has been placed.

Paint the tops and traffic sides of curbs at restricted parking locations as specified.

Apply yellow pavement markings to the tops and traffic sides of all island curbs, median curbs, and other similar curbs.

For estimating purposes, 100 linear feet (30.5 m) of curbing equals approximately 115 square feet (10.7 m2) of curb surface to be painted.

620.03.9 Marking Protection. Protect markings until dry. Correct smeared or damaged markings at Contractor expense.

620.03.10 Pavement Marking Removal. Remove existing temporary and final pavement markings using any of the following:

- Sand blasting with air or water;
- High-pressure water;
- Steam or super-heated water;
- Mechanically grinding, sanding, scraping, brushing.

Submit to the Project Manager at least 10 calendar days before use, the method or methods to be used. The Contractor may submit written proposals for other removal methods. An approved method may be subsequently disapproved if it damages the marking surface or inadequately removes existing markings.

Remove sand or other material on the surface left by the removal as the work progresses.

Satisfactorily repair surfaces damaged by marking removal at Contractor expense.

620.04 Method of Measurement.

620.04.1 Temporary and Interim Pavement Marking Quantities.

Temporary pavement markings are measured by the mile (kilometer) to the nearest 0.1-mile (0.1 kilometer).

Interim pavement markings are measured by the gallon (liter) to the nearest whole gallon (liter).

Only those pavement markings represented by a Manufacturer's Material Certification at the time of application, and actually used and witnessed on the project are eligible for payment.

620.04.2 Epoxy Pavement Markings. Epoxy pavement markings are measured by the gallon (liter) to the nearest whole gallon (liter). Only those pavement markings represented by a Manufacturer's Material Certification at the time of application, and actually used and witnessed on the project are eligible for payment.

Should the actual quantity measured by the Project Manager using tank stabs or totalizer exceed the quantity calculated using an application rate of 22 mils times the width and length of line applied, the lesser quantity will be paid.

620.04.3 Preformed Plastic and Thermoplastic Pavement Markings. Preformed plastic and thermoplastic pavement striping are measured by the linear foot (linear meter) to the 0.1-foot (0.1 meter).

Words and symbols are measured by the square foot (square meter) to the 0.3 square feet (0.1-square meter).

620.04.4 Painted Pavement Markings and Curbs. Painted pavement striping, words and symbols, stop bars, crosswalks, hash marks, and other striping not applied by a striping truck are measured by the gallon (liter) to the nearest whole gallon (liter). Painting curb is measured by the gallon (liter) to the nearest whole gallon (liter).

Quantity measurements are based on flow meter/totalizer readings taken before and after each run or if a calibrated tank is used, tank measurements are taken before and after each run. Computerized quantity print outs will be compared against tank stabs.

The amount of paint measured for payment is the difference between the start up readings and the end readings. All readings that measure paint for payment will be taken by the Project Manager. Provide all necessary assistance to make the readings including sufficient notice before the paint work begins.

620.04.5 Removal of Pavement Markings. Pavement striping removal is measured by the linear foot (meter) based on a 4-inch (100 mm) width, measured to the nearest whole foot (0.1 meter) for the actual quantity of striping removed. Lines wider and narrower than 4-inches (100 mm) are converted to the equivalent linear feet (meter) of 4-inch (100 mm) wide line.

Removal of words and symbols is measured by the square foot (square meter) to the nearest whole square foot (0.1 meter) and converted to the equivalent linear feet (meter) of 4-inch (100 mm) wide line.

620.04.6. Line Control. Establishing line control for pavement markings is not measured separately.

620.05 BASIS OF PAYMENT. Payment for the completed and accepted quantities is made under the following:

Pay Item	Pay Unit
Preformed Plastic/ Thermoplastic Pavement Striping	Linear Foot (meter)
Preformed Plastic/Thermoplastic Markings	Square Foot (Square Meter)
Truck-applied Painted Pavement Markings	Gallon (liter)
Words, Symbols, Stop Bars, Hash Marks	Gallon (liter)
Painted Curb Markings	Gallon (liter)

Temporary Pavement Markings	Mile (kilometer)
Interim Pavement Markings	Gallon (liter)
Remove Pavement Markings	Linear Foot (Linear Meter) or Square Foot(Square Meter)

Line control is not paid for separately, but is included in the cost of the pavement marking(s).

Make a written request to the Project Manager to adjust the unit price bid for temporary and interim pavement markings when seasonal factors warrant a change in the material type from the original bid material. Furnish invoice prices that the bid was based on and invoice prices for the material furnished and applied.

Interim stripe applied over temporary stripe is measured and paid for as interim stripe.

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the Contract.

SECTION 623 MAILBOXES Page 378 3-1-00

Add the following new Section:

Section 623 Mailboxes.

623.01 Description. This work is the furnishing and installation of mailboxes and crash-worthy supports at the specified locations or as directed.

623.02. Materials. Furnish Rubbermaid™ rubberized mailboxes, measuring at least 6½" wide by 7½" high by 18½" long (165mm X 190 mm X 470 mm), not exceeding 13 pounds (5.9 kg) in weight that meet the Postal Service requirements.

Furnish a crashworthy mailbox support as shown in the Detail Drawings, a mailbox support identified in the current edition of the AASHTO "Guide for Erecting Mailboxes on Highways", or other commercially manufactured crash tested mailbox support.

623.03 Construction Requirements. Install the mailbox and support meeting the contract requirements.

623.04. Method of Measurement. The mailbox and its support are measured as a unit.

623.05 Basis of Payment. Payment for the completed and accepted quantities is made under the following:

Pay Item	Pay Unit
Mailbox	Each

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the contract

701.02.4 CRUSHED BASE COURSE TYPE "A" Page 385 2-1-04

Rescind Subsection 701.02.4 and replace with the following:

701.02.4 Crushed Base Course Type "A"

Furnish crushed base course Type "A," including added binder or blending material, meeting Table 701-8 gradation requirements. Glass Cullet meeting Section 701.11 requirements may be used as blending material.

TABLE 701-8
TABLE OF GRADATIONS - CRUSHED BASE COURSE TYPE "A"

PERCENTAGE BY WEIGHT PASSING SQUARE MESH SIEVES				
	GRADE 5A		GRADE 6A	
SIEVE SIZE (mm)	Job Mix Target Limits	Job Mix Tolerance	Job Mix Target Limits	Job Mix Tolerance
2" (50 mm)	100			
1 1/2" (37.5 mm)	97	±3	100	
3/4" (19.0 mm)	78-80	±8	82-88	±8
3/8" (9.5 mm)	58-62	±8	52-64	±12
No. 4 (4.75 mm)	42-50	±8	36-48	±12
No. 40 (0.425)	14-22	±8	16-24	±10
No. 200 (0.075)	3-5	±3	3-5	±3

Meet the following requirements for crushed base course Type "A":

1) The maximum liquid limit and plasticity index for the material passing the No. 40 sieve is 25 and 6 respectively.
2) Dust ratio limitations do not apply.
3) A wear factor not exceeding 50 percent at 500 revolutions.
4) Furnish binder meeting Subsection 301.02.2 requirements.
5) At least 35% by weight of the aggregate retained on the No. 4 sieve has at least one mechanically-fractured face for Grade 5 and 25% for Grade 6.

701.02.6 CRUSHED TOP SURFACING TYPE "A" Page 387 3-1-00

Replace Table 701-10 Table of Gradations-Crushed Top Surfacing Type "A," in Subsection 701.02.6, with the following:

TABLE 701-10
TABLE OF GRADATIONS - CRUSHED TOP SURFACING TYPE "A"

PERCENTAGE BY WEIGHT PASSING SQUARE MESH SIEVES					
Sieve Size	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
1" (25 mm)	100				
¾" (19.0 mm)		100			
⅝" (16.0 mm)			100		
½" (12.5 mm)				100	
⅜" (9.5 mm)					100
No. 4 (4.75 mm)	40-70	40-70	40-70	40-70	50-80
No. 10 (2.00 mm)	25-55	25-55	25-55	25-60	35-70
No. 200 (0.075 mm)	2-8	2-8	2-8	2-8	2-8

701.03.2 AGGREGATE FOR PLANT MIX SURFACING Page 392 3-1-00

Rescind Table 701-15 and replace with the following:

TABLE 701-15
TABLE OF GRADATIONS - AGGREGATE FOR PLANT MIX SURFACING

PERCENTAGE BY WEIGHT PASSING SQUARE MESH SIEVES				
	GRADE A		GRADE B	
SIEVE SIZE (mm)	Job Mix Target Limits	Job Mix Tolerance	Job Mix Target Limits	Job Mix Tolerance
¾" (19.0)	100		100	0
½" (12.5)	87-93	±8	86-90	±7
⅜" (9.5)	77-83	±8	75-79	±7
No. 4 (4.75)	52-58	±7	51-57	±7
No. 10 (2.00)	36-41	±6	32-40	±6
No. 40 (0.425)	19-21	±5	14-16	±4
No. 200 (0.075)	6-8	±2	4.5-6.5	±1.5

Meet the following requirements:
1. A wear factor not exceeding 40% at 500 revolutions using Montana Test MT-209.
2. For Grade A aggregate at least 50% by weight of the coarse aggregate particles must have at least one mechanically-fractured face. For Grade B aggregate at least 60% by weight of the coarse aggregate particles must have at least two mechanically-fractured face.
3. The maximum liquid limit for the aggregate passing the No. 40 sieve is 25. The maximum plasticity index for Grade A aggregate is 6. Grade B aggregate must be non-plastic.
4. The final produced aggregate, including treated aggregate, must have a volume swell not exceeding 10% and cannot show cracking or disintegration.
5. The aggregate must not contain adherent films of clay and other matter that prevents thorough coating with bituminous material.

The target Marshall field density is established from test results using MT-311 on specimens molded with 50 blows per side.

701.03.2 AGGREGATE FOR PLANT MIX SURFACING Page 392 3-1-00

Add the following after Item 5:

A. PLANT MIX BITUMINOUS SURFACING - GRADE D. Furnish Plant Mix Bituminous Surfacing Grade D meeting all the specifications for Grade B except as modified below.

TABLE 701-15 A
TABLE OF GRADATIONS-AGGREGATE FOR PLANT MIX SURFACING

PERCENTAGE BY WEIGHT PASSING SQUARE MESH SIEVES	GRADE D		GRADE ____	
SIEVE SIZE (mm)	Job Mix Target Limits	Job Mix Tolerance	Job Mix Target Limits	Job Mix Tolerance
¾" (19.0)	100			
½" (12.5)	79-83	±7		
⅜" (9.5)	68-72	±7		
No. 4 (4.75)	44-50	±7		
No. 10 (2.00)	27-33	±6		
No. 40 (0.425)	12-15	±4		
No. 200 (0.075)	4.5-6.5	±1.5		

At least 60% of coarse aggregate particles by weight must have at least two mechanically fractured faces as determined by MT-217.

Aggregate used in the mix consists of crushed particles. Separate natural fines before crushing. Do not exceed 5% of minus No. 4 sieve material in the crusher feed.

The target Marshall field density is established from results of tests made using MT-311 from specimens molded with 75 blows per side.

701.04.1 BEDDING MATERIAL Page 393 1-1-03

Add the following sentence to the first paragraph:

Glass Cullet meeting Section 701.11 requirements may be used as blending material.

701.11 GLASS CULLET FOR SOIL-AGGREGATE FILLER Page 396 1-1-03

Add the following new Subsection:

701.11 GLASS CULLET FOR SOIL-AGGREGATE FILLER. When requested and approved as an aggregate blending material, furnish and blend Glass Cullet meeting AASHTO M-318. Meet the following requirements for the glass cullet and the blended product.

1. Furnish glass cullet containing no more than 5% cullet originating from non-beverage container glass. Furnish the Project Manager certification that the cullet meets this limit before it is used. If the cullet exceeds this limit, submit a laboratory test plan that meets the requirements of the appendices of AASHTO M-318. Approval of the cullet will be based on the approved testing plan and the test results.
2. Have the glass cullet tested to ensure it meets the physical properties and deleterious substances requirements in AASHTO M-318. Furnish the Project Manager copies of the test results before using the glass cullet.
3. Produce a glass cullet/ aggregate blended product that meets all requirements for the specified aggregate.
4. Limit the glass cullet content to no more then 20% of the total blended product.

702.02 TABLE 702-2 SCHEDULE OF TOLERANCES Page 399 9-1-95

Rescind Table 702-2 and replace with the following:

TABLE 702-2
SCHEDULE OF TOLERANCES

TEST	ALLOWABLE VARIATION From Min. Specification Requirement	From Max. Specification Requirement	REMARKS
Flash Test Asphalt Cement Cutback Asphalt	 -5% -10%		
Penetration Liquid Asphalt Distillation Residues	 -10%	 +10%	
% Residue from Distillation	5%		% of Total Distillate: 2 ml may be added or subtracted at any distillation temp. Before calculating the % recovered.
Ductility	-10%		
Solubility	-0.5%		
Viscosity Cutback Asphalts Emulsified Asphalts	 -10% 0%	 +10% +25%	Emulsified asphalt in violation of the minimum specification requirement subject to rejection and removal from the work or 50% price reduction at the Engineer's discretion.
% Residue of 100 Pen.	-5%	---	
Thin Film Oven Test % loss in wt. % retained Pen.	 --- -2%	 +10% ---	
Demulsibility and Sieve Tests	-10%	+10%	
Spot Test	NO TOLERANCE - Materials in violation of spec. subject to standard price reduction.		
Water	NO TOLERANCE - Materials in violation of spec. subject to rejection or 50% price reduction at the Engineer's discretion.		
Particle Charge	NO TOLERANCE - Materials in violation of spec. And any aggregate used in conjunction with its use will, at the Engineer's discretion, be either rejected or paid for at a unit rate not to exceed 50% of the cost of the materials.		

702.02 TABLE 702-3 SPECIFICATION FOR ASPHALT CEMENT Page 400 12-1-95

Rescind Table 702-3 and replace with the following:

TABLE 702-3
SPECIFICATION FOR ASPHALT CEMENT

	40-50		60-70		Penetration Grade 85-100		120-150		200-300	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Penetration at 25°C (77°F) 100 g. 5 sec.	40	50	60	70	85	100	120	150	200	300
Flash point, Cleveland Open Cup	450 (232°C)	---	450 (232°C)	---	450 (232°C)	---	425 (218°C)	---	350 (176°C)	---
Ductility at 25°C (77°F) 5 cm. Per min., cm	100	---	100	---	100	---	100	---	---	---
Solubility	99	---	99	---	99	---	99	---	99	---
Thin-film oven test, 1/8 in. (3.2 mm), 163°C (325°F) 5 hour loss on heating, percent	---	0.8	---	0.8	---	1.0	---	1.3	---	1.5
Penetration of residue percent of original	58	---	54	---	50	---	46	---	40	---
Ductility of residue at 25°C (77°F) 5 cm. Per min., cm.	---	---	50	---	75	---	100	---	100	---
Spot test	Negative for all grades									

702.02 TABLE 702-8 LATEX OR POLYMER MODIFIED CRS-2 EMULSIFIED PAGE 404 3-1-00

Add the following new table after Table 702-7.

TABLE 702-8
LATEX OR POLYMER MODIFIED CRS-2 EMULSIFIED ASPHALT

Property	Test Method	LMCRS-2	CRS-2P
Viscosity @ 122ºF (50ºC)	AASHTO T-59	75-400 Sec.`	50-400 Sec.
Sieve	AASHTO T-59	0.3% max.	0.3% max.
Settlement, 5 Days	AASHTO T-59	5% max.	5% max.
Demulsibility	AASHTO T-59	40% min.	40% min.
Storage Stability, Test 1 Day	AASHTO T-59	1% max.	1% max.
Particle Charge	AASHTO T-59	Positive	Positive
Ash Content	AASHTO T-111	0.2% max.	0.2% max.
Tests on Residue by Evaporation: Percent Residue	AASHTO T-59	65% min.	65% min.
Penetration @ 77ºF (25ºC), 100g, 5 sec.	AASHTO T-49	100-200	100-250
Ductility @ 77ºF (25ºC), 5 cm/min.	AASHTO T-51	40 cm, min.	75 cm, min.
Elastic Recovery	AASHTO T-301		58% min.
Torsional Recovery	MT-333	18% min.	

702.02 TABLE 702-9 PERFORMANCE GRADED ASPHALT BINDER Page 404 3-1-00

Add the following new Table:

TABLE 702–9
PERFORMANCE GRADED ASPHALT BINDER (PGAB)

Performance Grade	PG 52				PG 58				PG 64				PG 70			
	–22	–28	–34	–40	–22	–28	–34	–40	–22	–28	–34	–40	–22	–28	–34	–40
Average 7–day Maximum Pavement Design Temperature, °C	<52				<58				<64				<70			
Minimum Pavement Design Temperature, °C	>–22	>–28	>–34	>–40	>–22	>–28	>–34	>–40	>–22	>–28	>–34	>–40	>–22	>–28	>–34	>–40
Original Binder																
Flash Point Temp, T48: Minimum °C	230															
Viscosity, ASTM D 4402: Maximum, 3 Pa•s (3000 cP), Test Temp, °C M	135															
Dynamic Shear, TP5: G^*/sin delta, Minimum, 1.00 kPa Test Temperature @ 10 rad/s, °C	52				58				64				70			
Rolling Thin Film Oven (T 240) or Thin Film Oven (T 179) Residue																
Mass Loss, Maximum, %	1.0															
Dynamic Shear, TP5: G^*/sin delta, Minimum, 2.20 kPa Test Temperature @ 10 rad/s, °C	52				58				64				70			
Pressure Aging Vessel Residue (PP1)																
PAV Aging Temperature, °C	90				100				100				100			
Dynamic Shear, TP5: G^* sin delta, Maximum 5000 kPa Test Temperature @ 10 rad/s, °C	19	16	13	10	22	19	16	13	25	22	19	16	28	25	22	19
Creep Stiffness, TP1: S, Maximum, 300 Mpa m-value, Minimum, 0.300 Test Temp, @ 60 sec, °C	–12	–18	–24	–30	–12	–18	–24	–30	–12	–18	–24	–30	–12	–18	–24	–30
Direct Tension, TP3: Failure Strain, Minimum, 1.0% Test Temp @ 0.1 mm/min. C	–12	–18	–24	–30	–12	–18	–24	–30	–12	–18	–24	–30	–12	–18	–24	–30

703.02.1 PLASTIC CONDUIT Page 405 7-1-99

Rescind the first sentence and replace with the following:

Furnish rigid polyvinyl chloride meeting UL 651, schedule 80, 150ºF (66ºC) wire rated, direct bury type.

703.02.2 STEEL CONDUIT Page 405 6-1-00

Rescind the second sentence and replace with the following:

Cut a three foot (915 mm) test sample of conduit, witnessed by an inspector, from the end of each size of conduit to be used on the project. Conduit is tested under ASTM A 239.

703.04.1 GENERAL Page 406 7-1-99

Add the following after the third paragraph:

Meet the standard manufacturer's recommendations for the anchor bolt placement in the foundation.

Add the following sentence to Subsection 703.04.1:

Repair all damage to galvanized surfaces on poles and standards by applying one coat of cold galvanizing compound to the damaged area.

703.06.5 COMMUNICATION CABLE Page 409 7-1-99

Add the following new Subsection:

703.06.5 Communication Cable. Furnish BJFC 6 pair AWG No. 19 copper cable meeting REA specification PE-39. Do not splice this cable.

703.10.1 TRAFFIC SIGNAL HEADS Page 419 7-1-99

Revise the second sentence to read:

Use AWG No. 14 signal cable meeting Subsection 703.06.2 between the mast-arm mounted signals and the pole shaft mounted terminal block.

703.10.1 A. OPTICAL UNITS Page 419 7-1-99

Rescind the first sentence and replace with the following:

Furnish optical units consisting of a lens, reflector, lamp holder, and 120 volt, clear, 8,000-hour life, traffic signal lamp. Furnish 90, 91 or 116 watt traffic signal lamps rated at 1050 initial lumens for 8-inch (200 mm) signals and 135 watt traffic signal lamps rated at 1570 initial lumens for 12-inch lenses (300 mm).

703.10.1 H. DUAL COLOR ARROWS Page 421 7-1-99

Add the following new Subsection:

703.10.1(H) Dual Color Arrows. Furnish traffic signals equipped with a dual row of fiber-optic elements that produce a uniform display for yellow and green arrow indication. Ensure the fiber-optic elements have at least 74 light points and a 0.125-inch (3 mm) thick polycarbonate lens.

703.10.2 PEDESTRIAN SIGNALS Page 421 7-1-99

Rescind the last sentence and replace with the following:

Furnish clear 90, 91 or 116-watt traffic signal lamps rated at 1050 initial lumens, and 8,000 hours of life at 120 volts.

703.11.1 LOOPS Page 421 7-1-99

Add the following sentence to the eighth paragraph:

Use rosin core solder.

703.13 LUMINAIRES Page 422 7-1-99

Insert after the second sentence:

Furnish and install clear high pressure sodium vapor lamps having a 24,000 hour rated life. Meet the following wattage and initial lumens requirements:

200 Watt	22,000 initial lumens
250 Watt	27,500 initial lumens
400 Watt	50,000 initial lumens

703.17.7 OVERHEIGHT DETECTOR Page 425 7-1-99

Add the following new Subsection:

703.17.7 Overheight Detector. An overheight detector consists of a transmitter and receiver each mounted on a adjustable metal pole. Furnish detectors meeting the following requirements:

Operating Voltage:	115 AC ±10%
Operating Temperature Range:	-40ºF (-40ºC) to 130ºF (54ºC)
Detector Beam:	infrared or visible-red light-emitting-diodes (LED)
Alarm Output Adjustment	5 to 30 second duration

Ensure the detector can discern the vehicles direction of travel and is able to detect vehicles traveling between 2 MPH (3.2 km/hr) and 90 MPH (145 km/hr.).

Mount the transmitter and receiver on metal poles that permit adjusting the detector height from 10 to 16 feet (3.1 m to 4.9 m). Install and adjust the detectors on the poles following the manufacturer's recommendations.

Furnish the transmitter, receiver, two poles, anchor bolts, nuts, washers, all necessary wiring and connectors for this item. The concrete foundations are a separate item.

This work is measured under subsection 617.04.2 (4) and paid for under subsection 617.05.2.

704.01.4 ALUMINUM AND STEEL POSTS Page 428 9-1-98

Rescind subsection 704.01.4 and replace with the following:

704.01.4 Aluminum and Steel Posts.

A. General. Furnish posts meeting the Contract requirements. Treat steel post field cuts and holes with one coat of metal primer and two coats of aluminum paint. Coat galvanized posts meeting AASHTO M 111 specifications.

B. Steel Posts.

1) Structural Steel. Furnish structural steel posts having a nominal weight exceeding 3 pounds per foot (4.5 kg/m) meeting ASTM A 36 requirements. Bid these posts as "steel structural sign posts". Paint the posts meeting the Detailed Drawing requirements.

2) Steel U Sign Posts. Furnish steel posts formed into a "flying U " shape having a nominal weight exceeding 3 pounds per foot (4.5 kg/m) meeting AASHTO M 281. Bid these posts as "steel U sign posts."

3) Tubular Steel Posts. Furnish round tubular steel posts meeting ASTM A 53 Type E or S, Grade B requirements. Furnish square or rectangular tube posts meeting ASTM A 500 or 501 requirements. Painted or galvanized posts are acceptable. Meet ASTM A 123 requirements for galvanizing. Paint the posts meeting the Detailed Drawing requirements.

4) Square Tubular Steel Posts. Furnish square tubular steel sign posts, anchor posts, anchor sleeves, and splice sleeves meeting one of the following requirements as specified in the Contract:

a) ASTM A-446 Grade A, steel in 10 or 12 gauge having a 33,000 psi (22.7 MPa) minimum yield strength and a 45,000 psi (31 MPa) minimum tensile strength.

b) ASTM A-570, steel in 12 or 14 gauge having a 60,000 psi (41.4 MPa) minimum yield strength and a 75,000 (51.7 MPa) minimum tensile strength. Use ASTM-A 307 Grade 2 bolts and nuts. Ensure the sign posts, sleeves, anchor posts, auxiliary fittings and anchor sleeves have 7/16-inch (11 mm) diameter holes or knockouts on 1-inch (25 mm) centers on all four sides. The permissible pole straightness variation is 1/16-inch in 3 feet (1 mm per m) with the corner radius being 5/32-inch (4 mm) plus or minus 1/64-inch (0.4 mm).

c) Coat the post with Type 2 aluminum paint at a minimum 0.75 ounces per square foot (228 kg per m²) of surface area, measured by triple spot testing under AASHTO T-213. Follow with a chromate conversion coating, and a thin acrylic or polymer resin film; or a triple coating of hot dipped zinc weighing 0.60 ± 0.15 ounces per square foot (183 kg ±4.3 kg per m²) meeting AASHTO M-120, followed by a chromate conversion coating 15 ± 5 micrograms per square inch (645 mm²), and a clear organic coating 0.2 ± 0.1 mils (0.005 mm ± 0.0025 mm) thick on the outside surface. Provide double in-line application of a full zinc-based organic coating 1.2 ± 0.6 mils (0.003 mm ± 0.0015 mm) thick tested under ASTM B-117 on the inside surface.

C. Aluminum U Posts. Furnish aluminum posts made of AA6061-T6 alloy extruded to a U channel meeting ASTM B 209.

705.01.2 WOOD POSTS AND BLOCKS Page 433 9-1-00

Rescind Subsection 705.01.2 and replace with the following:

705.01.2 Wood Posts and Blockouts. Furnish wood posts and blockouts made from Douglas Fir, Hemlock, Ponderosa Pine, Spruce, Larch, or Lodgepole pine. Furnish posts that are straight, sound, free from defects and meet the dimensions specified in the Contract.

Meet the Western Wood Products Association requirements, or equivalent grading rules, all of which must meet ASTM D 245.

Ensure the posts surfaces do not vary more than 1-inch (25 mm) from a straight line connecting the ends. Saw the wood posts before treating. Ensure the wood posts are seasoned to accept the specified treatment. Furnish wood posts and blocks treated with a minimum 5% by weight pentachlorophenol solution or Chromated Copper Arsenate (CCA), type B or C, or Ammoniacal Copper Arsenate (ACA) meeting AWPA standards. The minimum penetration depth is ½-inch (13 mm). Do not paint posts unless specified.

Other acceptable blockouts may be manufactured from steel, recycled plastic, and recycled plastic with wood fibers provided information is furnished that they meet NCHRP 350 requirements for the application, i.e., for use with wood, concrete or steel guard rail posts.

Use only one type of blockout in each run of guardrail.

708.01.1 GENERAL Page 445 4-1-99

Rescind the last sentence and replace with the following:

Use Type V cement unless otherwise specified.

709.12 TYPE II ALUMINIZED CORRUGATED STEEL PIPE Page 449 9-1-95

Add the following Subsection:

709.12 Type II Aluminized Corrugated Steel Pipe. Furnish pipe and coupling bands fabricated from material meeting AASHTO M274 requirements. Assure the prefabricated pipe and coupling bands meet the applicable Subsection 709.02 requirements.

710.02 B.1. FOLIAGE GREEN PAINT Page 452 9-1-95

Delete this subsection entirely.

711.01.2 EPOXY-COATED REINFORCING BARS Page 457 8-1-97

Add the following:

Assure the bars are coated by an applicator plant certified under the Concrete Steel Institute's certification program for Fusion-Bonded Epoxy Applicator Plants, or equivalent certification program.

711.02 STRUCTURAL STEEL Page 457 6-1-97

Rescind A., and replace with the following:

A. Bridge superstructure applications meeting AASHTO M 270/M 270M.

Use material meeting Charpy V-notch impact test requirements for zone 3 to fabricate webs, flanges in tension or stress reversal zones, splice plates, w-shaped rolled beams.

This requirement applies to diaphragms and diaphragm connection plates for horizontally curved girders.

711.10 STEEL PILING Page 458 11-1-04

Rescind subsections 711.10.1 and 711.10.2 and replace with the following:

711.10.1 Structural Steel Piles. Furnish new steel H piles, smelted and manufactured in the USA, meeting AASHTO M270 Grade 345 MPa (50 ksi) and Contract requirements.

711.10.2 Steel Pipe Piles. Furnish new steel pipe piles, smelted and manufactured in the USA, meeting ASTM A 252, Grade 2 requirements with a minimum yield strength of 310 Mpa. Steel pipe diameter and wall thickness is specified in the contract.

711.16 FIBER REINFORCED PADS Page 459 3-1-96

Rescind the first sentence and replace with the following:

Furnish vulcanized rubber-fiber pads made from new unvulcanized rubber and synthetic fibers.

712.01.03 POSTS, RAILS, AND BRACES Page 461 2-1-96

Change Table 701-1 in the first sentence to read Table 712-1.

712.02.1 WOVEN WIRE Page 464 7-1-03

Replace Section 712.02.1 of the Standard Specifications with the following:

712.02.1 Woven Wire. Furnish woven wire meeting ASTM A 116 requirements and the following:

A. Interstate Wire Fence. Use woven wire that meets either of the following designations

Specification	Grade	Design Number	Metallic Coating
• ASTM A 116	No. 12½ Grade 60	832-6-12½	Type Z, Class 1
• ASTM A 116	No. 14 Grade 125	832-6-14	Type Z, Class 3

B. Farm Fence. Use woven wire that meets either of the following designations:

Specification	Grade	Design Number	Metallic Coating
• ASTM A 116	No. 12½ Grade 60	•	Type Z, Class 1
• ASTM A 116	No. 14 Grade 125	•	Type Z, Class 3

*Provide a 6-inch (155 mm) stay spacing. Match the fence height and mesh dimensions of the fence being replaced if not specified.

712.02.08 WOOD FENCE POSTS AND BRACE RAILS Page 465 6-1-02

Effective July 1, 2002, rescind 712.02.8 (A) and replace with the following:

A. General. Make fence posts and brace rails from well seasoned, sound, and straight-grained Western Larch, Lodgepole Pine, Ponderosa Pine, or Douglas Fir. Remove all bark from the posts.

Taper round posts to be driven fro 8 to 12 inches (205 to 305 mm) up from the bottom to a 1-inch (25 mm) point. Taper the post tops to a round top with a minimum 3-inch (75 mm) diameter for line posts and 4-inches (105 mm) for corner, brace, pull, end, and gate posts. These taper lengths are included in the specified post lengths. Perform all tapering before treatment. Treat the posts and rails meeting subsection 706.04.1.

Use minimum 4-inch (105 mm) diameter brace rails.

Ensure the posts and rails are straight so that a line running from the center of both ends is within the body of the post or rail.

713.02 HYDRATED LIME Page 467 11-1-04

Delete the last sentence of Subsection 713.02.

713.10.5 RECYCLED PAPER FIBER MULCH Page 471 4-1-01

Rescind items 2 and 3 and replace with the following:

2. Contain at least 90% organic matter (oven dry) when tested under ASTM D 586;
3. Have a pH of between 5.5 and 8.0;

713.13 TABLE 713-6 (ENGLISH) Page 476 10-1-03

Rescind Table 713-1 (English) and replace with the following:

TABLE 713-6 (English)
GEOTEXTILES & GEOMEMBRANES
GEOTEXTILES GEOMEMBRANES

PROPERTY	TEST METHOD	DRAINAGE		EROSION CONTROL		SEPARATION/STABILIZATION		SEDIMENT CONTROL	PAVING	LIQUID/VAPOR BARRIER	
		LIGHT	HEAVY	CL1	CLII &III	MEDIUM SURVIVABILITY	HIGH SURVIVABILITY			LIGHT	HEAVY
Grab Strength (lbs.)	ASTM D 4632	80	180	90	200	180/115 **	270/180 **	90	80	--	--
Grab Elong %	ASTM D 4632	--	--	15	15	<50%/>50% **	<50%/50% **	50% Max @ 45 lbs.	50% @ Break	--	--
Puncture 60 (lbs.)	ASTM D 4833	25	80	40	80	70/40 **	100/75 **	--	--	30 ***	60 ***
Trap Tear (lbs.)	ASTM D 4533	25	50	30	50	70/40 **	100/75 **	--	--	--	--
App. Opening Size (Sieve Size)	ASTM D 4751	50 Max	30 Max	40 Max	40 Max	40 Max	40 Max	20 Max	--	--	--
Flow Gal/Min/Ft²	ASTM D 4491 (MOD.)	80	80	70	25	*	4.2	15	--	0.0	0.0
Ultraviolet Deg. 70% Ret. Strength	ASTM D 4355	150 Hrs	150 Hrs	150 Hrs	150 Hrs	150 Hrs	150 Hrs	500 Hrs	--	--	--
Melting Point (Deg. F)	ASTM D 276	--	--	--	--	--	--	--	300	--	--
Asphalt Ret. (Ga/Yd5)	AASHTO M 288	--	--	--	--	--	--	--	0.2	--	--
Thickness Mils (1mm=40 mils)	ASTM D 3765 (MOD)	--	--	--	--	--	--	--	--	30	60

NOTES (TABLE 713-6):

ACCEPTANCE - All values are minimum roll average values. Acceptance will be in accordance with ASTM D 4759.

DRAINAGE - Light - use for sandy to clayey soils. Heavy - use for coarse sands and gravels.

*FLOW - Flow rates will be specified in the Special Provisions.

**SEPARATION/STABILIZATION - Geotextiles with <50% elongation require the higher grab, puncture and trap tear strength values.

***GEOMEMBRANE - Test method for puncture will be in accordance with FTMS 101C-Method 2065.

713.13 TABLE 713-6 (METRIC) Page 478 10-1-03

Rescind Table 713-1 (Metric) and replace with the following:

TABLE 713-6 (Metric)
GEOTEXTILES & GEOMEMBRANES
GEOTEXTILES GEOMEMBRANES

PROPERTY	TEST METHOD	DRAINAGE		EROSION CONTROL		SEPARATION/STABILIZATION		SEDIMENT CONTROL	PAVING	LIQUID/VAPOR BARRIER	
		LIGHT	HEAVY	CL1	CLII &III	MEDIUM SURVIVABILITY	HIGH SURVIVABILITY			LIGHT	HEAVY
Grab Strength (N)	ASTM D 4632	355	800	400	885	800/510	1200/800 **	400	355	--	--
Grab Elong %	ASTM D 4632	--	--	15	15	<50%/≥ 50% **	<50%/≥ 50% **	50% Max @ 20.4 kg	50% @ Break	--	--
Puncture (N)	ASTM D 4833	110	355	175	355	310/175 **	440/330 **	--	--	130 ***	260 ***
Trap Tear (N)	ASTM D 4533	110	220	130	220	310/175 **	440/330 **	--	--	--	--
App. Opening Size (Sieve Size)	ASTM D 4751	50 Max	30 Max	40 Max	40 Max	40 Max	40 Max	20 Max	--	--	--
Flow L/Min/m²	ASTM D 4491 (MOD.)	3256	3256	2849	1017	*	160	407	--	0.0	0.0
Ultraviolet Deg. 70% Ret. Strength	ASTM D 4355	150 Hrs	150 Hrs	150 Hrs	150 Hrs	150 Hrs	150 Hrs	500 Hrs	--	--	--
Melting Point (Deg. C)	ASTM D 276	--	--	--	--	--	--	--	148.8	--	--
Asphalt Ret. (L/m²)	AASHTO M 288	--	--	--	--	--	--	--	0.9	--	--
Thickness mm (1mm=40 mils)	ASTM D 3765 (MOD)	--	--	--	--	--	--	--	--	.75	.75

NOTES (TABLE 713-6 Metric):

ACCEPTANCE - All values are minimum roll average values. Acceptance will be in accordance with ASTM D 4759.

DRAINAGE - Light - use for sandy to clayey soils. Heavy - use for coarse sands and gravels.

*FLOW - Flow rates will be specified in the Special Provisions.

**SEPARATION/STABILIZATION - Geotextiles with <50% elongation require the higher grab, puncture and trap tear strength values.

***GEOMEMBRANE - Test method for puncture will be in accordance with FTMS 101C-Method 2065.

714.04 TEMPORARY AND INTERIM PAINT MARKINGS Page 483 8-1-04

Rescind Subsection 714.04 and replace with the following:

714.04 Temporary and Interim Pavement Markings. The Contractor may furnish either liquid pavement markings or solid pavement marking tape for temporary and interim pavement markings. Furnish the Project Manager, at least 10 calendar days before application, a manufacturer's formulation sheet or data sheet for the product to be used.

A. Temporary Pavement Markings. Furnish marking materials that meet the following:
   1. Color
      a. White. Color to match Federal color chip #37875. Colorimeter readings may be taken on the white portion of a Leneta form 5c.[1] Color Coordinates are Y=79.80, x=0.3136, y=0.3244. A ±6% tolerance applies to the coordinates.
      b. Yellow. Color to match Federal color chip #595B-33538. Colorimeter readings may be taken on the white portion of a Leneta form 5c. Color coordinates are Y=48.32, x=0.4851, y=0.4455. A ±6% tolerance applies to the coordinates.

B. Interim Pavement Markings. Furnish marking materials that meet the following:
   a. Color
      a. White. Color to match Federal color chip #37875. Colorimeter readings may be taken on the white portion of a Leneta form 5c[1] if requested by the Project Manager. Color Coordinates are Y=79.80, x=0.3136, y=0.3244. A ±6% tolerance applies to the coordinates.
      b. Yellow. Color to match Federal color chip #595B-33538. Colorimeter readings may be taken on the white portion of a Leneta form 5c if requested by the Project Manager. Color coordinates are Y=48.32, x=0.4851, y=0.4455. A ±6% tolerance applies to the coordinates.

714.05 REFLECTIVE GLASS BEADS Page 483 8-1-04

Rescind Subsection 714.05 and replace with the following:

714.05 REFLECTIVE GLASS BEADS.

A. General. Provide glass beads for reflectorizing traffic pavement markings that are spherical, transparent, have a smooth, lustrous surface and meet the pavement marking manufacturer's recommendations. Ensure the delivered beads are free from extraneous material and bead clumps easily break up while handling and distributing onto the stripe.
B. Imperfections. Ensure the glass beads:
   1. Do not contain more than 20% irregularly shaped particles when tested under ASTM D 1155;
C. Color. Ensure the glass beads do not impart a noticeable daytime hue to white pavement markings.
D. Chemical Stability. Ensure the beads can withstand refluxing in distilled water in a Soxhlet extractor for 90 hours without noticeable dulling of the surface luster and not more than 2.5% loss in weight.
E. Gradation. Meet the following gradation, tested using ASTM D-1214.

Sieve No:	Percent Passing
20 (0.850 mm)	100
30 (0.600 mm)	75-95
50 (0.300 mm)	15-35
100 (0.150 mm)	0-5

F. Packaging and Marking. Package glass beads in moisture-proof containers marked to identify the contents, manufacturer, lot number, batch number and net weight.
G. Samples. Furnish the Project Manager upon request a sample of the beads. The Department will furnish the containers.

714.06.5 TABLE 714-2 Page 487 9-1-00

Rescind Table 714-2 and replace with the following:

TABLE 714-2 COMPOSITION

Component	White	Yellow
Binder, Hydrocarbon Base	16.0% min.	16.0% min.
Glass Beads	25% min.	25% min.
Titanium Dioxide, Type I or II	10% min.	---------- ----------
Calcium Carbonate and Inert Fillers	42% max.	----------
Yellow Pigments	----------	See Note

714.07 WATERBORNE PAVEMENT MARKING PAINT Page 487 8-1-03

Rescind subsection 714.07.1 in the current supplementals and replace with the new subsection 714.07.1:

714.07.1 Water-Borne Pavement Marking Paint. Furnish acrylic latex white and lead-free yellow water-borne pavement marking paint meeting the following requirements.

A. Composition. The exact composition is at the manufacturer's discretion except that the vehicle is to be 100% acrylic polymer and the paint is not to contain any ingredient listed below.

Lead or chromate compounds; Mercury; Lead; Chromate compounds; Chlorinated Solvents; Hydrolyzable chlorine derivatives; Ethylene based glycol ethers and their acetates.

Meet the following requirements:

	White	Yellow
Pigment, % solids ASTM D-3723	68 max	68 max
Total Solids, % by weight ASTM D-2369	75 min	75 min
Titanium Dioxide, lbs./gal. ASTM D-4563 & D-1394	1 lb. min.	0.15 lbs. min.
% Non-volatile vehicle of total vehicle weight. (ASTM D-2697)	41 min.	41 min.
VOC content, maximum EPA Method 24	150 g/L	150 g/L
pH, min. ASTM E -70	9.6	9.6
Viscosity (Krebs Stormer), K.U., ASTM D-562 @ 77ºF,(25ºC)	80 - 95	80 - 95
Grind, Hegman, min. ASTM D-1210	2	2
Deviation in Weight per gallon, max. (from manufacturer specified weight)	±.30 lbs.	±.30 lbs.
Daylight[1] Reflectance, min. ASTM D- 2805	85	59.1[2]
Contrast Ratio, 15 mils wet min., ASTM D-2805	0.92	0.88

[1]The Y-Tristimulus value (luminance) is obtained using a standardized Tristimulus colorimeter using a C illuminant at a two degree observation angle. The paint sample is drawn to a 15 mil wet film thickness over a white substrate. The department uses a Hunter Lab Miniscan XE Colorimeter and Leneta Corporation Form 5C opacity charts to determine this value.

[2]Color to match the V+ color on the Hale color chart ±6%

ASTM TEST	WHITE AND YELLOW	
D 711 mod.[1]	Dry Time, 15 mil wet film, 65% RH, minutes, max.	10
D 1640 mod.[2]	Dry Through @ 90% RH, 15 mil wet film, minutes, max.	130

ASTM TEST	WHITE AND YELLOW	
D 2243[3]	Freeze-Thaw, White and Yellow	Pass
D 2486	Scrub Resistance, cycles min.	1000
D-969, Bleeding Ratio, min.		0.95

[1]Use a wet film thickness of 15 plus or minus 1 mil. Immediately place in a humidity chamber controlled at 65 ± 3 % relative humidity and 72.5ºF ± 2.5ºF (22.5ºC ± 1.4ºC) with minimal air flow.

[2]Apply a 15± 1 mil thick film to a non-absorbent substrate and place in a humidity chamber controlled at 85 ±5 % R.H. and 72.5ºF ± 2.5ºF (22.5 ±1.4ºC). Determine dry through time under ASTM D 1640 exerting the minimum pressure needed to maintain contact with the thumb and film.

[3]See B (7), Freeze-Thaw Stability.

1. Titanium. Use Titanium Dioxide meeting ASTM D-476, Type I or II.

B. Characteristics.

1. Flexibility and Adhesion. Apply 15 mil wet film thickness to a three inch by five inch (75 mm by 130 mm) tin panel. Dry at 77ºF (25ºC) for 24 hours followed by two hours at 122ºF (50ºC). Bend sample over a ½-inch (13 mm) mandrel. Paint to adhere firmly without showing cracking or flaking.

2. Water Resistance. Apply 15 mil wet film thickness to a 4" by 8" (102 mm by 203 mm) glass plate. Dry at 77ºF (25ºC) for 72 hours. Immerse in distilled water at 77ºF (25ºC) for 24 hours. Air dry for two hours on a flat surface. Paint to not show blistering or adhesion loss.

3. Skinning and Lumps. Fill a pint (0.473 L) container ¾ full of paint and seal tightly. After 72 hours, strain paint through a 100 mesh screen. No lumps or skin retained on the screen is permissible.

4. Settling. Fill a centrifuge tube with paint and revolve for two hours at 1112 Newtons (250 ft/lbs) . Separation from top of vehicle to top of pigment not to exceed 13 mm (½-inch).

5. Skinning. Fill ½ pint (0.236 L) container half full of paint and seal. Let stand for 24 hours. No skinning to be visible.

6. Bleeding. When tested under ASTM D-969 paint to not show perceptible bleeding when painted on a bituminous surface.

7. Freeze-Thaw Stability. When tested under ASTM D-2243, paint to not show coagulation or viscosity change exceeding 10 Krebs units.

8. Static Heat Stability. Pour paint into a pint (473 mL) within 0.25 inches (6.4 mm) of the top, put the lid on and seal with tape, and place the container in an oven heated to 60ºC ± 1ºC (140ºF ± 2ºF) for seven days. Equilibrate the paint at standard conditions and thoroughly mix by stirring for at least five minutes. Ensure the paint does not show signs of livering, hard settling, coagulation, lumps or course particles. Perform a consistency test meeting ASTM D-562 at 25ºC (77ºF). Paint viscosity to not vary 10 K.U. from the original viscosity measured at 25ºC (77ºF).

C. Packaging and Marking. Meet subsection 714.04.9 requirements.

D. Sampling and Acceptance. Draw three samples meeting subsection 714.04.8 requirements.

E. Retro-reflective Glass Beads. Use silene-coated moisture resistant glass beads meeting subsection 714.05 requirements.

F. Application. Follow the manufacturer's requirements for pavement cleaning and traffic paint application or as follows, whichever is more restrictive. Apply to a dry surface.

Clean the pavement of all loose rock, dirt, and debris immediately before applying the traffic paint.

Do not heat the traffic paint to exceed 110ºF (43.3ºC) before and during application.

Apply the traffic paint when the ambient temperature is 50ºF (10ºC) and rising. Stop application when the temperature is 50ºF (10ºC) and dropping and when rain or other weather adverse to the traffic paint during its drying time is imminent.

Apply traffic paint at 15 mils (0.38 mm) ±1 mil (0.025 mm), wet thickness in a single application meeting subsection 620.03.3(A).

Re-paint using materials meeting specifications, at Contractor expense, all striping represented by paint samples where any specified property is outside 20% of the specified value. Subsection 620.05 tolerances do not apply.

714.08 EPOXY PAVEMENT MARKING MATERIAL Page 488 8-1-04

Add the following new section:

714.08 Epoxy Pavement Marking Material – 100% solid.

A. Description. This work is furnishing the epoxy pavement marking meeting the following:

B. Materials.

1. General. Furnish a two component 100 percent solids epoxy material not containing fillers or pigment extenders. Follow the manufacturer's mixing ratio when mixing the two components. Mix the components within ±2.5% of the manufacturer's recommended mix ratio. Ensure the components, when combined, do not contain or produce volatile solvents.

Ensure the Resin/Pigment component meets the following requirements:

Meet the following percentages by weight:

Pigment	White	Yellow
TiO_2, meeting ASTM D-476, Type II	18-25	12-17
Organic Yellow		7-9
Epoxy Resin	75-82	74-82

Test the epoxy content of the epoxy resin following ASTM D 1652 and calculate as the weight per epoxy equivalent (WPE) for both white and yellow. Determine the epoxy content on a pigment free basis. The accepted epoxy content range (WPE) is ±50 of the manufacturer's target value.

Ensure the Activator/Curing Agent meets the following requirements:

- Test the amine value under ASTM D 2074. Ensure the total amine value meets the manufacturer's target value with the acceptance range being ±50 of the target value.

2. Combined Materials Requirements

a. Hardness. Ensure the epoxy has a Shore D hardness of between 75 and 100 when tested under ASTM D 2240. Apply the epoxy to a metal substrate.

b. Tensile Strength. Test the tensile strength under ASTM D 8638. Meet a minimum 6000 psi (42 MPa) tensile strength. Cast the Type IV specimens in a mold not exceeding ¼-inch (6.38 mm) thick. Ensure the pull rate is ¼-inch (6.38 mm) per minute.

c. Compressive Strength. Test the epoxy under ASTM D 695, as modified below. Meet a minimum compressive strength of 12,000 psi (83 MPa), using a maximum compression rate of ¼-inch (6.38 mm) per minute with the sample measuring ½-inch (12.7 mm) high by ½-inch (12.7 mm) in diameter.

d. Weather Resistance. Apply the mixed epoxy, both white and yellow, at 15 mils ±1 mil thick to 3 x 6-inch (75 mm x 150 mm) aluminum panels. Do not apply beads to the epoxy sample. Expose the cured sample in an Environmental Test Chamber meeting ASTM G 53. Conduct the test for 80 hours at 122° F (50° C), alternating four-hour cycles of condensation and ultraviolet light.

e. Color.

White: Color to match Federal color chip #37875. Colorimeter readings may be taken on the white portion of a Leneta form 5c[1] if requested by the Project Manager. Color Coordinates are Y=79.80, x=0.3136, y=0.3244. A ±6% tolerance applies to the coordinates.

Yellow: Color to match Federal color chip #595B-33538. Colorimeter readings may be taken on the white portion of a Leneta form 5c if requested by the Project Manager. Color coordinates are Y=48.32, x=0.4851, y=0.4455. A ±6% tolerance applies to the coordinates.

[1] The Y-Tristimulus value (luminance) is obtained using a standardized Tristimulus colorimeter using a C illuminant at a two degree observation angle. The sample is drawn to a 15 mil wet film thickness over a white substrate. The Department uses a Hunter lab Miniscan XE Colorimeter and a Leneta Corporation Form 5C opacity chart to determine this value.

i. Laboratory No-Track Time. Mix the epoxy marking material at the manufacturer's specified ratio and apply at 15 mils ± 1½ mils (0.381 mm ± 0.0381 mm) thick wet film at 75° F ± 2° F (24° C ± 1° C) with the specified glass bead application. Ensure it has a maximum no tracking time of 30 minutes when tested using ASTM D 711.

ii. Viscosity. Ensure the individual components viscosity is within 10 percent of each other at the recommended spray temperature and that the activator/curing agent has a constant viscosity at the manufacturer's recommended spray temperature.

iii. Mixing and Application. Mix and apply the components following all of the manufacturer's recommendations.

iv. Packaging and Storage. Transport and store the epoxy marking material at the project in the manufacturer's original container. Follow the manufacturer's instructions for material storage and handling. Ensure each container is marked identifying the color, batch or lot number, manufacturer's name, address, and date of manufacture.

v. Material Acceptance. Furnish a manufacturer's certification that has a certified copy of a laboratory report listing the results of the specified tests and certifying that the materials furnished meet the specifications. Refer to the applicable specification in the certification. Perform the tests in the manufacturer's laboratory or another qualified independent laboratory. Conduct the tests on samples obtained from the lot or lots of material supplied for the work.

vi. Glass beads. Use glass beads meeting Subsection 714.05 requirements and treated with coatings recommended by the pavement marking manufacturer.

715.03 ADVANCE WARNING ARROW PANELS Page 489 9-1-98

Rescind the first paragraph of Subsection 715.03 and replace with the following:

Furnish advance warning arrow panels (arrow boards) meeting Part 6 of the MUTCD, equipped with at least 25 lamps.